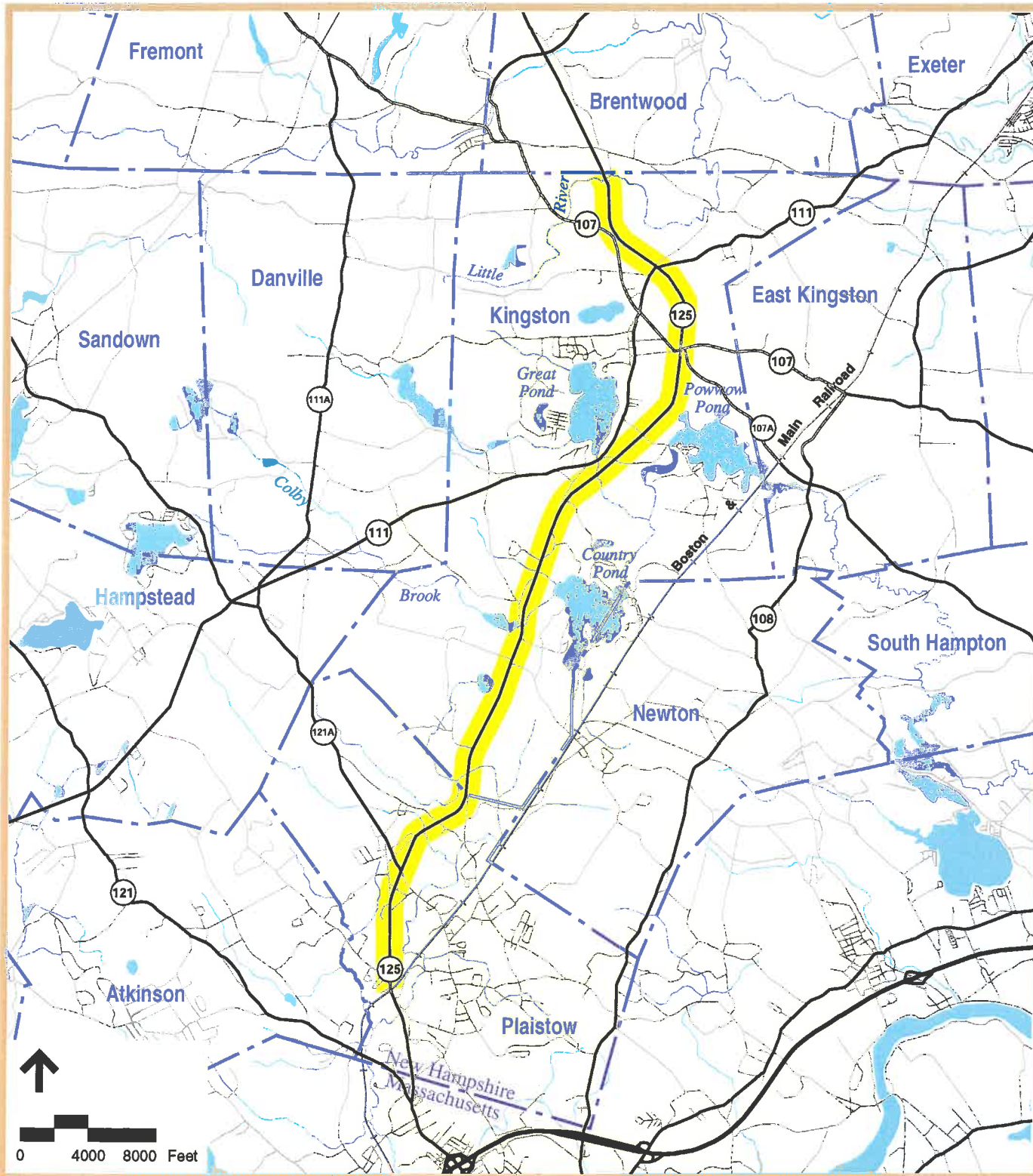


FEASIBILITY STUDY



NH 125

Plaistow and Kingston, New Hampshire

Prepared for



Rockingham Planning Commission

Prepared by

VHB Vanasse Hangen Brustlin, Inc.

Bedford, New Hampshire

in association with

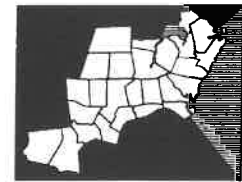
Rockingham Planning Commission

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September, 1999

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Executive Summary

This study has been prepared for the purpose of determining the existing and future transportation needs of the NH 125 corridor in Plaistow and Kingston, New Hampshire, and to develop a comprehensive plan and program of improvements and strategies to meet those needs. The study provides an evaluation of existing conditions, the development of an interim improvement plan, the development and evaluation of a future design year condition, the development of a long-range corridor improvement plan, and the establishment of an access management plan.

Existing Condition

The results of the existing conditions inventory and evaluation revealed a number of operational, safety, and access related deficiencies. These existing deficiencies include the absence of turn lanes, insufficient illumination, poor alignment and sight lines, and a lack of intersection definition. The signalized NH 125/Main Street (NH 121A) intersection currently operates close to or at capacity during the weekday evening peak hour while the left-turn exiting movements from most of the unsignalized intersections along the corridor operate at poor levels of service.

The proposed interim improvements are as follows:

- ✓ • Install traffic signal control at the New Boston Road intersection.
- ✓ • Provide an exclusive left-turn lane on the NH 125 northbound approach at Old Coach Road.
 - Reconstruct and realign the Kingston Road intersection to create a more typical T-type intersection. Provide an exclusive left-turn lane on NH 125 southbound approach.
 - Widen NH 125 at Old County Road to provide exclusive left-turn lanes on the northbound and southbound approaches to the intersection.
- ✓ • Widen NH 125 and Main Street to provide exclusive left-turn lanes on all four approaches to the NH 125/Main Street intersection.
 - In addition to the physical roadway modifications, improved illumination should be provided along the corridor. Specific intersections include Exeter Road (Route 111), Depot Road (Route 107), New Boston Road, Colonial Road, Kingston Road, and Jesse George Road.

All of the recommended interim improvement projects as identified in the study, with the exception of the Kingston Road realignment project, were recommended by the MPO for inclusion in the FY1999-2001 State Transportation Improvement Program and three (the New Boston Road, Old Coach Road, and Main Street projects) are scheduled for implementation within the next one to three years (1999-2001). The department has held Public Informational

Kingston 13012 (Ad. 1999)

Plaistow 12917 (Ad. 2000)

/ Public Officials meetings in the appropriate communities to discuss proposed preliminary engineering designs and to solicit public input.

Future Condition

To establish an appropriate future design volume condition, traffic volumes for the corridor were projected to the year 2016. The future traffic volume projections were based on an analysis of the land development potential of the corridor. The resulting annual growth rates range from a low of 1.5 percent along the southern segment of the corridor too as high as 2 percent along the northern segment.

Long-Range Improvement Plan

The projected traffic volume demands indicate that the long-term plan for the corridor should consider the widening of NH 125, south of the Hunt Road and Newton Junction Road intersections, to a four-lane cross-section (2 through lanes in each direction) while with the successful implementation of an access management plan, a two lane section (1 lane in each direction) can be maintained along the segments of the corridor north of this area. Each of the primary intersections will be widened to a five-lane cross section (2 through lanes and an exclusive left-turn lane in each direction). The primary intersections include:

- Danville Road
- Main Street (NH 121A)
- Old County Road
- Hunt Road/Newton Junction Road
- New Boston Road
- Depot Road
- Exeter Road

In addition to the recommended roadway and intersection improvements, the long-range improvement plan incorporates a comprehensive access management plan aimed at more effectively managing the flow of traffic along the corridor. The access management plan provides local oversight as to the number, spacing, and design considerations of all access points onto the corridor. Some of the recommended access management tools include the following.

- Minimum spacing between driveways shall be a function of the posted speed limit and would range from 150' for a speed of 35 mph to 275' for a speed of 50 mph.
- Commercial driveways shall not exceed 36' in width (exclusive of a center median).

- Lots with frontage only onto NH 125 shall be restricted to a single driveway unless it can be clearly demonstrated that an additional driveway is needed to provide good circulation.
- To encourage the use of shared driveways, minimum lot size and frontage requirements can be reduced by 10 percent for lots with access to an adjacent parcel on NH 125, and by 20 percent for lots with access to an adjacent parcel with access to roadways other than NH 125.
- All development projects subject to site plan review shall provide interconnecting driveways or easements for future connections.
- Lots with frontage onto both NH 125 and an intersecting side street shall not be permitted to access NH 125 unless it can be demonstrated that access onto the intersecting street would create a more significant environmental or traffic impact.
- The minimum driveway throat length shall be designed to accommodate the maximum probable queue (95th percentile queue) during the peak hour.

Preliminary Construction Cost Estimate

The total construction cost of the proposed long-range plan, exclusive of the cost of land acquisition, is approximately \$21,480,000. The preliminary construction cost estimates broken out by intersection and roadway segment are as follows:

INTERSECTIONS:

Marshall Road	\$ 75,000
Exeter Road	\$ 1,510,000
Depot Road	\$ 1,395,000
New Boston Road	\$ 1,485,000
Hunt Road/Newton Junction Road	\$ 1,750,000
Kingston Road	\$ 1,180,000
Old County Road	\$ 1,485,000
Jesse George Road & Main Street	<u>\$ 2,470,000</u>
	\$11,350,000

SEGMENTS:

NH 125 from Exeter Road to Newton Junction Road	\$ 3,990,000
NH 125 from Newton Junction Road to Kingston Road	\$ 2,915,000
NH 125 from Old County Road to Main Street	\$ 967,500
NH 125 from Jesse George Road to East Road	<u>\$ 2,257,500</u>
	\$ 10,130,000

Project Prioritization

Through input from the NH 125 Technical Advisory Committee, each of the improvement projects have been programmed into three groups for establishing priorities. Group 1 has been assigned the highest priority, with Group 2 second, and Group 3 last. The projects within a specific group are not prioritized in any particular order. The projects have been prioritized as follows:

Group 1	Hunt Road/Newton Junction Road Intersection Danville Road and Main Street Intersections NH 125 from Jesse George Road to East Road <i>Group 1 Costs - \$ 6,477,500</i>
Group 2	Kingston Road Intersection Old County Road Intersection NH 125 from Old County Road to Main Street <i>Group 2 Costs - \$ 3,632,500</i>
Group 3	Marshall Road Intersection Exeter Road Intersection Depot Road Intersection New Boston Road Intersection NH 125 from Newton Junction Road to Kingston Road NH 125 from Exeter Road to Newton Junction Road <i>Group 3 Costs - \$ 11,370,000</i>

MPO Transportation Plan / TIP Process

The biennial update of the Salem-Plaistow-Windham (SPW) Metropolitan Planning Organization (MPO) Transportation Plan and Transportation Improvement Program has taken place concurrently with the completion of this study. The project-specific recommendations and the grouped priorities identified in the study have served to guide the project application process. The long-range projects identified under Groups 1 and 2 have been submitted to the New Hampshire Department of Transportation (NHDOT) for consideration under the current update of the State of New Hampshire Ten-Year Transportation Improvement Program.

While the outcome is uncertain, the intent of the submittal is for these project-specific recommendations to be funded out of the existing \$10.333 million NH 125 reconstruction project that is listed in the currently adopted State Ten-Year Program (Project # 10044B). The current funding level is approximately sufficient to construct the improvements identified under the first two groups. The third group is included in the long-range element of the MPO Transportation Plan and is recommended for inclusion in the State Ten-Year Program as soon as financially feasible. This study will be forwarded to the NHDOT to be used as a guide in the implementation process.

Community Involvement Process

The NH 125 Corridor Feasibility Study is the product of a unique collaboration between the towns of Plaistow and Kingston (Salem-Plaistow-Windham Metropolitan Planning Organization - MPO), the Rockingham Planning Commission and the New Hampshire Department of Transportation. It was initiated by Kingston and Plaistow and their genuine desire to do more than simply react to continued growth pressures along NH 125 - but to truly plan the future of this important regional highway corridor.

There are many individuals and organizations to thank for the positive outcome of this study. It would not have been possible without the financial support of the New Hampshire Department of Transportation (NHDOT) and would not have succeeded without their commitment to use the results in implementing highway improvements along the corridor.

The project was carefully and effectively guided along the way by the NH 125 Corridor Study Advisory Committee and especially by the valuable insights and input provided by the towns' representatives, Ellen Faulconer, Lesley Hume, and Ken Briggs from Kingston, and Marilyn Senter from Plaistow. The Planning Boards and Highway Safety Committees from both communities provided valuable input on various elements of the study.

Lastly, the Rockingham Planning Commission Staff, namely Leigh Komornick, John Krebs, David Pelletier and Cliff Sinnott have been the "glue" that has kept the project together and moving forward. It is through the MPO's ongoing efforts, and in cooperation with the NHDOT, that the conceptual plans identified here will see the light of day.

The study presented, and benefited from, many opportunities for community involvement. This involvement occurred at various levels, starting with landowners, and the general public and incorporating board officials, and the Metropolitan Planning Organization. The following summarizes how community officials and other affected parties were kept informed about and encouraged to participate in the study.

125 Corridor Advisory Committee

The first milestone in the study was the establishment of an Advisory Committee. The function of this Committee was to oversee the overall development of the study, to act as liaison with the communities and to provide initial feedback on the recommendations developed. The Committee consists of 2 to 3 representatives from each town (appointed by their Board of Selectmen) as well as representatives from the MPO, the NHDOT and the project consultants (VHB and Complex Systems Research Center).

The Advisory Committee was charged with the following tasks:

- develop and endorse the project scope of work;
- review technical and other work products;
- acting as liaison between the project team, other boards and the public;
- provide expertise on local conditions;
- sponsoring public informational meetings; and
- establish good working relationship between neighboring communities who share the highway.

The Committee met approximately 12 times during the 18+-month course of the study and provided the consultants and MPO staff with extremely valuable input.

Direct Land Owner Contact

The importance of communicating directly with the landowners that may be affected by the study's recommendations was recognized from the beginning. MPO staff developed a complete mailing list of approximately 135 landowners abutting NH 125 in the study area. This list was used initially to inform landowners about the study (in the form of a fact sheet describing the purpose, scope and intended outcome of the study) and subsequently to invite them to a series of public informational meetings. This list was supplemented with names and addresses of other affected parties, as they become known.

Public Informational Meetings

A series of public information meetings were held during the study. The first was held following the initial data collection phase, and was primarily for the purpose of introducing the study and defining its scope. Subsequent meetings were held to present key elements of study recommendations and to receive input from all interested parties. The public informational meetings were as follows.

Public Informational Meetings
NH 125 Corridor Feasibility Study

Date	Location	Purpose
Dec-18-1996	Kingston Town Hall	Present Study Information and Scope Review data collection and key findings
Jan-28-1997	Plaistow Town Hall	Present and receive comments on Interim Improvement Recommendations (to be included in Draft 99-01 TIP)
Apr-23-1998	Plaistow-Vic Geary Center	Present Long Range Recommendation
May-7-1998	Kingston Town Hall	Introduce Access Management Concepts
Jul-22-1998	Kingston Town Hall	To present Long Range Draft Report including fund and Access Management Recommendations. Conclude Study.

12/96
18 mo
7/98

MPO Involvement

Throughout the study, the Salem-Plaistow-Windham MPO technical and policy committees were provided with updates on the progress of the study. The MPO supported the addition of three (3) interim improvement recommendations to the Draft FY 99-01 Transportation Improvement Program for the region.

Involvement of Local Officials

From time to time during the study, Advisory Committee Members, MPO Staff and the Project Consultant had contact with other local boards in both towns to keep them appraised of the study and to seek their input. These contacts included meetings with the Plaistow TRC, and the Boards of Selectmen and Highway Safety Committees from both towns. These meetings were valuable in gauging the level of support for the recommendations being developed.

Introduction

Vanasse Hangen Brustlin, Inc. (VHB) has been retained by the Rockingham Planning Commission to conduct a transportation planning study of the NH 125 corridor in Plaistow and Kingston, New Hampshire. The ten-mile study corridor (shown in Figure 1) extends southerly from the Brentwood-Kingston town line to the East Road/Joanne Drive intersection in Plaistow. The purpose of the study is to determine the existing and future transportation needs of the corridor and to develop a comprehensive plan and program of improvements and strategies to meet those needs.

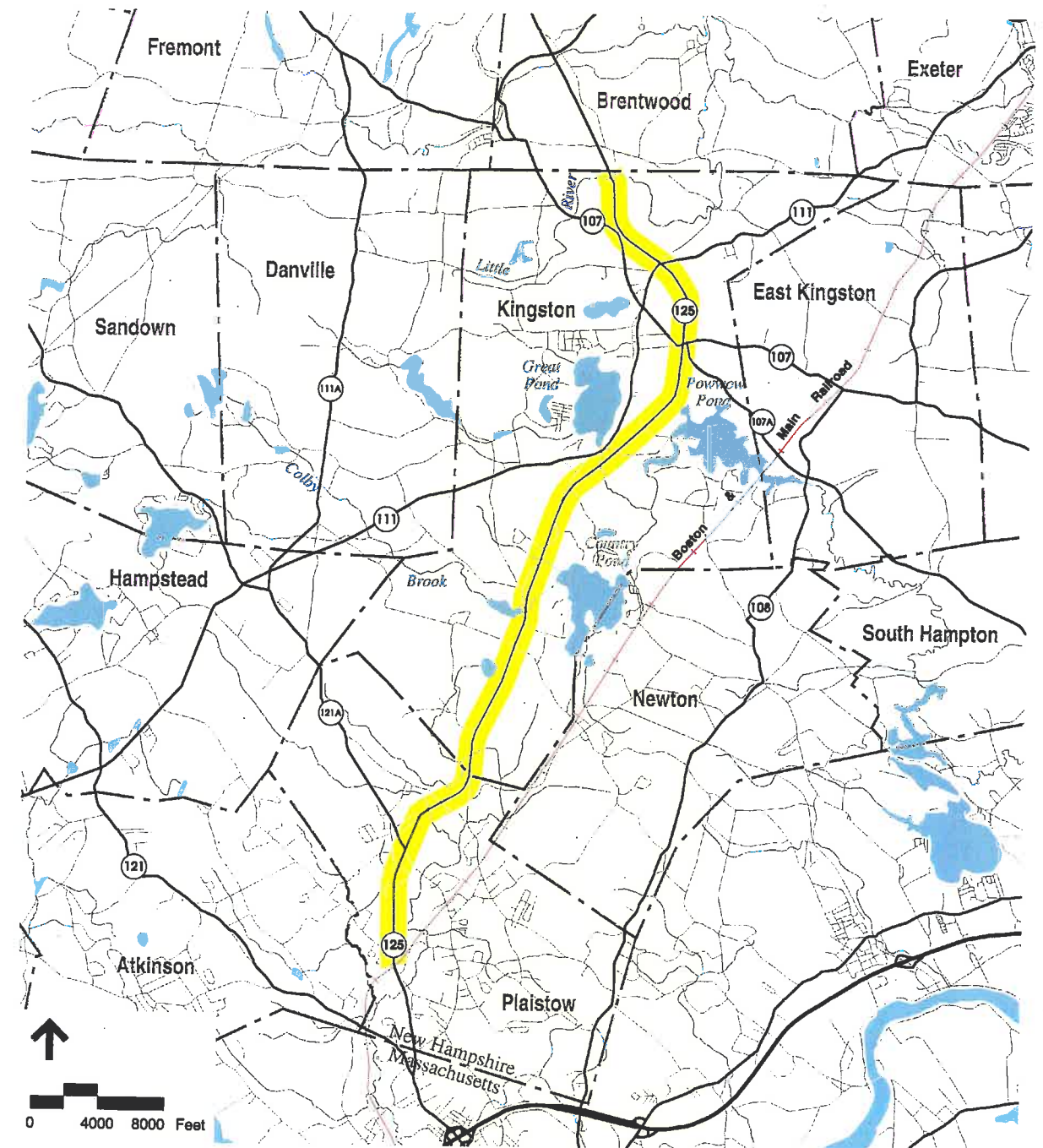
The study provides an evaluation of existing conditions, the development of an interim improvement plan, the development and evaluation of a future design year condition, the development of a long-range corridor improvement plan, and the establishment of an access management plan.

The need to plan for and implement highway improvements to the NH 125 corridor has been acknowledged as far back as 1976, when Plaistow Selectmen discussed the need to study the corridor. While significant improvements have been made to NH 125 from the MA/ NH state-line north to and including the Westville Bridge, the remainder of the corridor between the Westville Bridge and the Kingston Brentwood town line remains a two-lane roadway with five-foot shoulders. It is this more northerly segment that is the subject of the *NH 125 Corridor Feasibility Study*. The basic purpose of this study is to develop conceptual plans for future highway related improvements in the corridor, and in addition, to provide recommendations to the communities and the New Hampshire Department of Transportation (NHDOT) on ways to manage future growth and development along NH 125.

Over the past two to three years, a series of incremental, mostly minor, improvements have been made by the NHDOT along the section of NH 125 under study including:

- Lane striping and reconfiguration changes at the New Boston Road/ NH 125 intersection,
- Shoulder widening at the Newton Junction/ Hunt Road/ NH 125 intersection,
- Shoulder improvements at the intersection of Mill Road and NH 125,
- A new connection of Route 111 and NH 125,

FIGURE 1



- The reconfiguration of the Route 107/ NH 125 intersection that eliminated the “jug handle” and replaced it with an exclusive left-turn lane on the NH 125 northbound approach,
- The replacement of islands at the Route 111/ NH 125 and Route 107 south/ NH 125 intersections,
- Overall resurfacing from New Boston Road north to the Route 107 north/ Route 125 intersection.

The NH 125 Reconstruction Project, described as “Westville Bridge to the Kingston Bypass,” has been listed in the Salem-Plaistow-Windham Metropolitan Planning Organization’s *Transportation Improvement Project (TIP)* and in the State’s *Ten-Year Program for Transportation Improvements* for nearly 10 years. Over the past several years this project has been delayed due both to the fiscal constraints in the State Ten Year Program and by the decision to allocate Federal transportation dollars to other higher priority projects elsewhere in the region and the state. In the current Ten-Year Program and TIP, the preliminary engineering for the project is slated to begin in 1999, with construction not scheduled until 2004-2005.

Although the reconstruction of this segment of NH 125 is six years away, a lot can, and probably will, happen within the corridor between now and then. Over the past three years, the communities of Plaistow and Kingston have become increasingly concerned over the continued growth of the corridor and resulting safety problems. Officials from both Plaistow and Kingston have expressed the need to understand, at least in conceptual form, the nature and extent of likely improvements to the corridor as part of the reconstruction project so that they can anticipate these improvements as they carry out their community planning and site plan review responsibilities.

In response to this need and at the request of the MPO, the NHDOT agreed to fund a *corridor feasibility study* in advance of the preliminary engineering phase of the project. Unlike the preliminary engineering that will follow, this study is limited in scope to develop only conceptual plans for addressing highway deficiencies. These plans will not be defined or engineered to the point where the extent of environmental impacts or land takings will be identified. However, the plans will show the type and location of improvements that will be necessary to accommodate anticipated traffic growth for the next 20 years, and will identify both short and long-term solutions. It may also facilitate the logical phasing of project implementation in the event that the corridor improvements can not be funded and completed as a single project.

In summary, this study is intended to provide the basic “blueprint” for future improvements to the corridor, and in addition, to provide recommendations to the communities and the NHDOT on ways to manage future growth and development along the corridor through improved access management, zoning controls and site planning.

Existing Conditions

This section describes and summarizes the findings of the existing conditions data collection inventory, the development and evaluation of the base year traffic volume condition, and presents a set of interim improvement actions aimed at addressing existing operational and safety related deficiencies. The specific topics described and summarized include: land use regulations and policies, traffic volumes, vehicle speeds, accident research, operational analyses, field observations, and the recommended interim improvement actions.

Land Use Regulations and Policies

NH 125 within the study area is diverse in both its natural and cultural conditions and no single set of policies, ordinances and regulations governs development along the corridor. The purpose of this section is to examine the status of land use regulations and policies in the corridor and to assess their adequacy in accommodating the highway and access management improvements that are recommended herein.

PLAISTOW MASTER PLAN

The town's general goals as they pertain to this study are to 1) provide for the safe, convenient, and efficient movement of vehicles within the town; and 2) ensure timely and orderly development of public services, facilities, and utilities necessary to support existing and anticipated development.

Plaistow's current master plan was prepared in 1988 and is expected to be updated in the near future. The 1988 plan includes a section on transportation that defines the existing highway network, traffic volumes, street and highway conditions, and current projects and needs in Plaistow. In other chapters, the town outlines its general development policies, as well as those specific to transportation.

According to a Citizen Survey Questionnaire conducted in the summer of 1987, citizens expressed concern about the residential and commercial growth. Citizens believed that the town was growing too rapidly without the benefit of good planning, and supported locating any industrial expansion along either NH 125 or Route 108. There was additional concern that the environment is being destroyed as the result of development that had already occurred and that

the town should be more carefully considering the demand on town services created by additional development on NH 125.

The Master plan expresses a number of observations, recommendations, and assumptions concerning future land use that is applicable to NH 125. These include:

- The town has chosen not to implement or plan for the future implementation of municipal sewer and water services and has instead relied on on-site sewer and water to govern development density. This has resulted in a relatively low density, sprawling development pattern.
- On NH 125, predominant market forces combined with the lack of central services and a linear commercial zone (C-1) on NH 125 has encouraged a "strip" commercial development pattern along the highway. The lack of central sewer and water facilities tends to encourage scattered and premature development.
- Plaistow can accommodate future needs for a regional shopping facility, provided that the commercial areas do not allow for conflicting residential development. The master plan goes on to state that, "Over-zoning for such commercial development should be avoided in order to discourage marginal commercial strip developments. In addition it identifies the need for commercial establishments in the eastern portion of town adjacent to southern portions of Newton and, to some extent, northern portions of Haverhill.

Beyond these observations, no explicit plan for future development on NH 125 is articulated in the Master Plan. The next Master Plan will undoubtedly have more to say on the subject of development on NH 125 since it has become an important policy issue for the town. Since the last Plan was written, the town has invested in at least two engineering studies of its own to help define what roadway improvement would be necessary to accommodate future traffic growth, especially in the southern most segments of NH 125 (south of the study area for this project). These studies have become the basis for a new impact fee system for roadway improvements adopted in 1997 (see below). The town has also expressed interest in developing and adopting an access management plan for NH 125, as a possible outgrowth of this Corridor Feasibility Study.

PLAISTOW ZONING ORDINANCE

General

The current Plaistow Zoning Ordinance establishes eight (8) conventional use districts. NH 125 directly abuts just two of these, the Commercial 1 ("C-1") and Industrial ("IND"). Within 1000 ft. of the centerline of NH 125 (defined as the study area for this study), however, 5 of the 8 zones are present

- Low Density Residential
- Medium Density Residential
- Affordable Elderly Housing Community
- Commercial 1
- Industrial

District Provisions

The specific requirements of the C-1 and IND districts regarding permitted uses and dimensional requirements are shown in Table 1.

The Commercial 1 District encompasses the entire length of Plaistow. In most locations it extends to 500 feet in width on both sides of the highway. Exceptions where it is narrower are near Blossom Road and Railroad Avenue, where the Industrial District abuts, and, where the Industrial Zone abuts the west side of the highway, north of Old County Road. The C-I District is intended to serve as a highway commercial zone and the commercial "center" for both the town and surrounding region. The stated objectives for land development in the district are to have good highway access, adequate off-street parking, lighting and public safety, and adequate on-site sewer and water facilities. This zone encompasses approximately 533 acres of the 1,737 acres of study area within Plaistow, or about 31 percent.

The Industrial District is intended to provide location opportunities for industrial plants in order to improve employment opportunities and expand the tax base of the community. Development is to emphasize minimal impact to residential uses, have good access to transportation facilities and the potential for future serviceability by public sewer and water facilities. This zone includes approximately 447 acres of the study area within Plaistow, or about 26 percent.

TABLE 1

SUMMARY OF EXISTING ZONING DISTRICT STANDARDS - PLAISTOW AND KINGSTON

District Regulation	PLAISTOW		KINGSTON	
	"COMMERCIAL 1" (C-1)	"INDUSTRIAL" (I)	"RURAL RESIDENTIAL" (RR)	"INDUSTRIAL" (I)
1.0 Permitted Uses				
1.1 Permitted	Accessory use; Bank; Motel; Church; Business Office; Commercial Recreation; Essential Service; Funeral Establishment; Personal Service Business; Private/Service Club; Professional Office; Public Use Facilities; Publishing; Restaurant; Retail Business; Storage of Equip.; Vehicular, Trailer, Rec.; Vehicle Sales/Service; Wholesale business; Small Industry ; Theaters; Multi-modal Park & Ride.	Accessory Uses; Aviation; Contractor's Yard; Essential Service; Light Industry; Office; Outdoor Storage; Public Use Facilities; Publishing; Recycling Plants; Research & Testing Labs; Trucking Terminal; Warehouse.	All non-industrial uses are permitted subject to site plan review	Public garages; Repair shops; Automobile, boat, farm and industrial equipment sales; Sale of furniture, plumbing, construction and building material supplies; Animal hospitals; Greenhouses; Nurseries; Boarding kennels; Construction and home appliance repair shops; Manufacturing plants for electronics, appliances, instruments; Research and testing labs of a non-hazardous nature; Cement, rock crushing and stonewashing plants.
1.2 Special Exception	Care and Treatment of Animals Drive-in Restaurants Produce Stand Adult Oriented Business	Auto Service Stations Bank Drive-in Restaurants Restaurants Vehicular Sales and Repairs	see above	Roads, streets and other utilities
2.0 Dimensional Requirements				
2.1 Minimum Lot Size	40,000 sq. ft., min., plus soil type lot size requirement	40,000 sq. ft., min., plus soil type lot size requirement	80,000 sq. ft.	120,000 sq. ft.
2.2 Frontage	150 ft.	150 ft.	200 ft.	200 ft.
2.3 Max. Lot Coverage	75%	75%	NA	70%
2.4 Min. Open Space	NA	NA	NA	NA
2.5 Max. Height	35 ft.	35 ft.	35 ft.	35 ft.
2.6 Building Setback	If Abutting Residential	If Abutting Residential		
front	50 ft. 50 ft.	50 ft. 50 ft.	20 ft.	100 ft. from State Highway
side	35 ft. 50 ft.	50 ft. 100 ft.	20 ft.	25 ft.
back	35 ft. 50 ft.	50 ft. 100 ft.	20 ft.	25 ft.
other	-- --	-- --	--	500 ft. from residential devel.
3.0 Applicable Overlay Zones	Floodplains Ord. Wetlands Ord.	Floodplains Ord. Wetlands Ord.	Floodplain Development Ord. Wetlands Conservation Dist. Aquifer Protection Dist. Shoreland Protection Dist. Historic District	Floodplain Development Ord. Wetlands Conservation Dist. Aquifer Protection Dist. Shoreland Protection Dist. Historic District

General Provisions

One Building per Lot: Not more than one house or other principal building or structure is allowed on a single lot. For CI, Industrial and ICR combined zones, more than one (1) principal building per lot may be constructed if the Planning Board finds that multiple buildings improve the general health, safety and welfare of the public.

Driveways: Permits are required for the construction of driveways or the reconstruction of driveways from the town highway department for town roads and from the NH Department of Transportation for driveways on State Highways. The usual sequence is that applicants for projects on state roads are encouraged to get their driveway permits from the NHDOT before completing their application to the Planning Board for subdivision or site plan approval.

Overlay Zones

The town has a Wetlands Conservation District and Flood Hazard District, which function and overlay zones and exist wherever the natural conditions occur that defines them. Wetlands (poorly and very poorly drained soils) and Flood Hazard Areas (100-Year Floodplain) are depicted for the study area on Figures 3 and 4, respectively. Building activity is prohibited in all defined wetland area, including a wetland buffer areas, extending 50 to 75 feet beyond the wetland itself. Road and utility access ways are permitted uses in certain conditions. In the Floodplain Development District, building is permitted, but only if protected from flooding conditions. Residential buildings must be elevated above the 100-year flood elevation; non-residential buildings must be flood-proofed.

Special Provisions - Impact Fees

In 1997 (and amended in 1998), Plaistow enacted Article XIV of the Zoning Ordinance – “Impact Fee System for Road Improvements.” The intent is to help accommodate increased traffic demand occasioned by land development along the NH 125 corridor. The fee system was an outgrowth on a 1996 study conducted for the town by Vanasse & Associates, Inc. entitled Route 125 Corridor Study/Impact Fee System (10/25/96). The impact fee system assesses a proportional share of new roadway capital improvements within the corridor as necessitated by further retail development. Non-retail development is excluded from assessments.

The fees are assessed at different rates based on the size of the facility and the proposed locations, as indicated below:

RETAIL FACILITY Building Size	Impact Fee per Square Feet (SF)	
	So. Of Westville Rd.	No. of Westville Rd.
0 – 50,000 SF	\$1.10	\$0.87
50,000 – 100,000 SF	\$0.87	\$0.69
100,000 + SF	\$0.74	\$0.59

The impact fees collected from this system will be used to offset town costs for improvements needed along NH 125.

PLAISTOW SUBDIVISION REGULATIONS

General

Plaistow's Subdivision Regulations govern the subdivision of land to establish consistent standards of subdivision layout design and construction, and to provide for the timely installation of necessary improvements. The subdivision regulations include provisions for application and review procedure, approval procedures, septic system design, road and street design, water supply and drainage, and provisions for easements, public sites and open spaces, and floodplain development regulations. These regulations can have a significant impact on new development within the NH 125 Corridor study area.

Review Authority Related to Roadways

Of relevance to the NH 125 Corridor, the intentions of the Subdivision regulations include:

- to provide against scattered and premature development by reason of lack of services and facilities (including transportation facilities);
- to require the proper arrangement and coordination of streets in relation to other existing and planned streets;
- to require suitably located street of sufficient width to accommodate existing and projected traffic;
- to require that land proposed for development is suitable for the intended purpose.

Technical Review Committee; Highway Safety Committee

In 1996 Plaistow established an inter-departmental Technical Review Committee (TRC) for the purpose of providing the Planning Board with a technical assessment of proposed subdivision and site plan review applications. The TRC assesses, among other things, access/egress design, traffic safety and general impact, onsite circulation and parking, and other aspects as appropriate. The TRC have improved the level of review that applications

Corridor consists of a 2000' buffer on each side of NH 125.

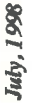


Figure 2.

NH 125 Plaistow-Kingston Corridor

Feasibility Study - Buildout Analysis

Corridor consists of a 2000' buffer on each side of NH 125.

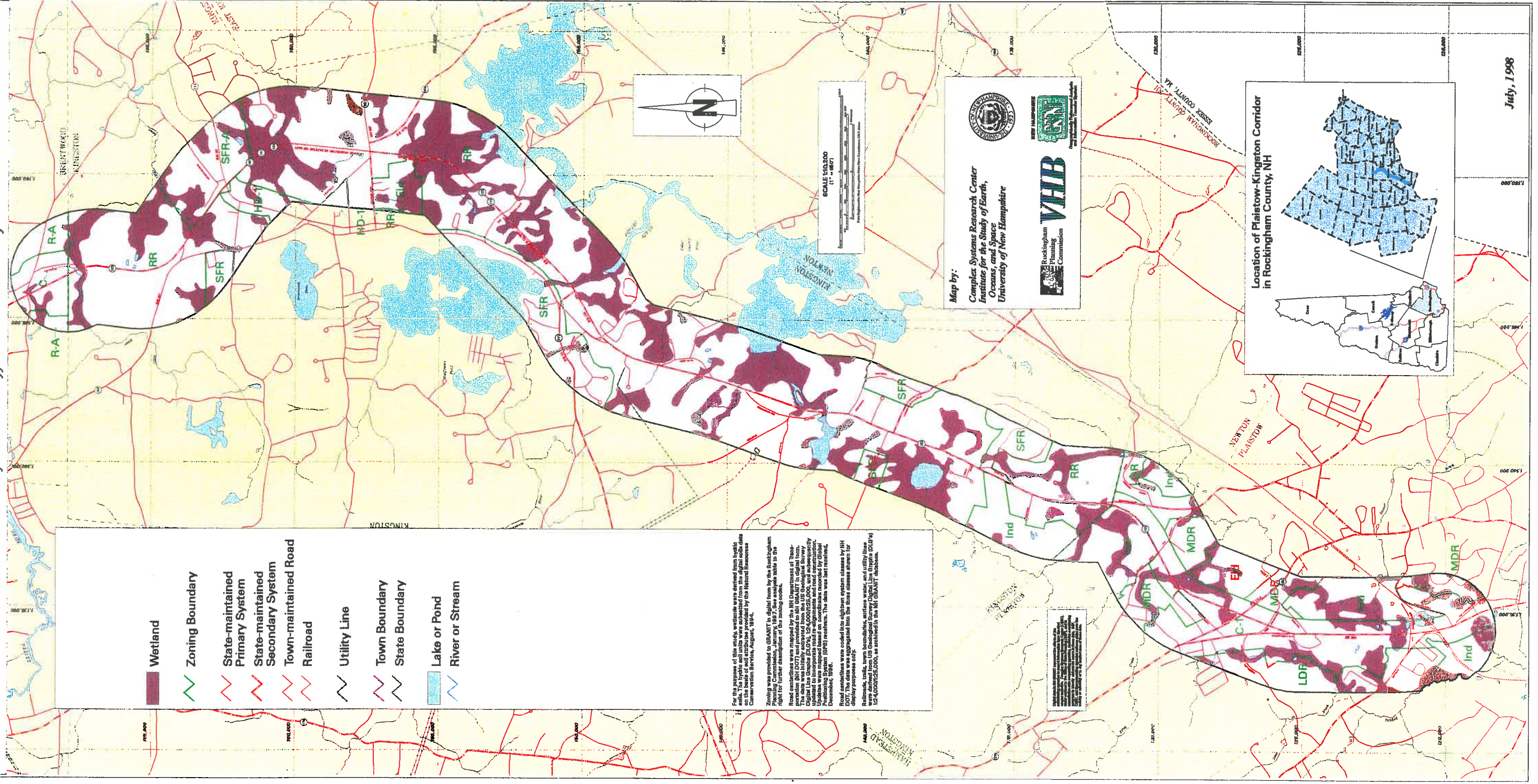


Figure 3

Corridor consists of a 2000' buffer on each side of NH 125.

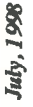


Figure 4

NH 125 Plaistow-Kingston Corridor

Feasibility Study - Buildout Analysis

Corridor consists of a 2000' buffer on each side of NH 125.

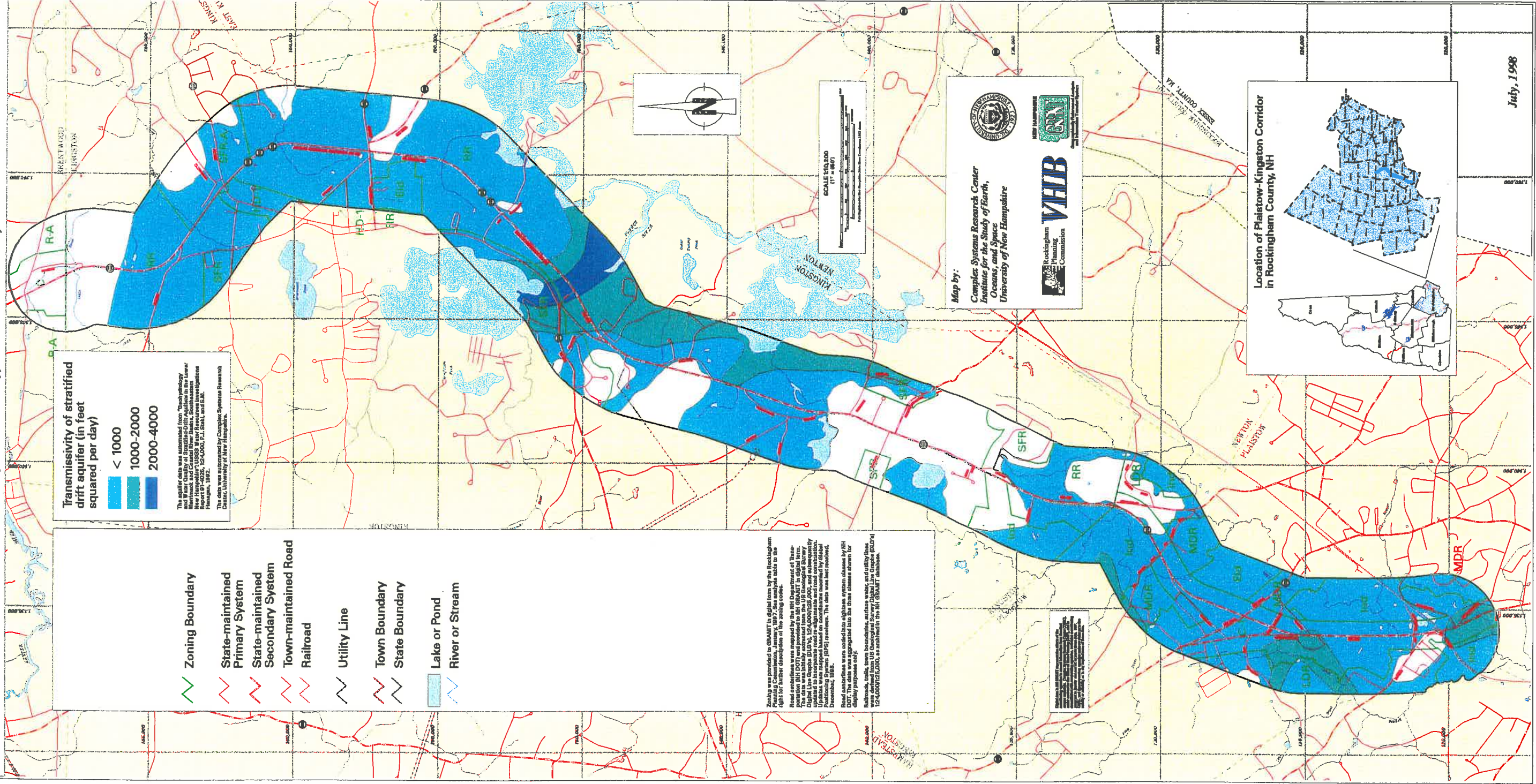


Figure 5

NH 125 Plaistow-Kingston Corridor Feasibility Study - Buildout Analysis

Corridor consists of a 2000' buffer on each side of NH 125.

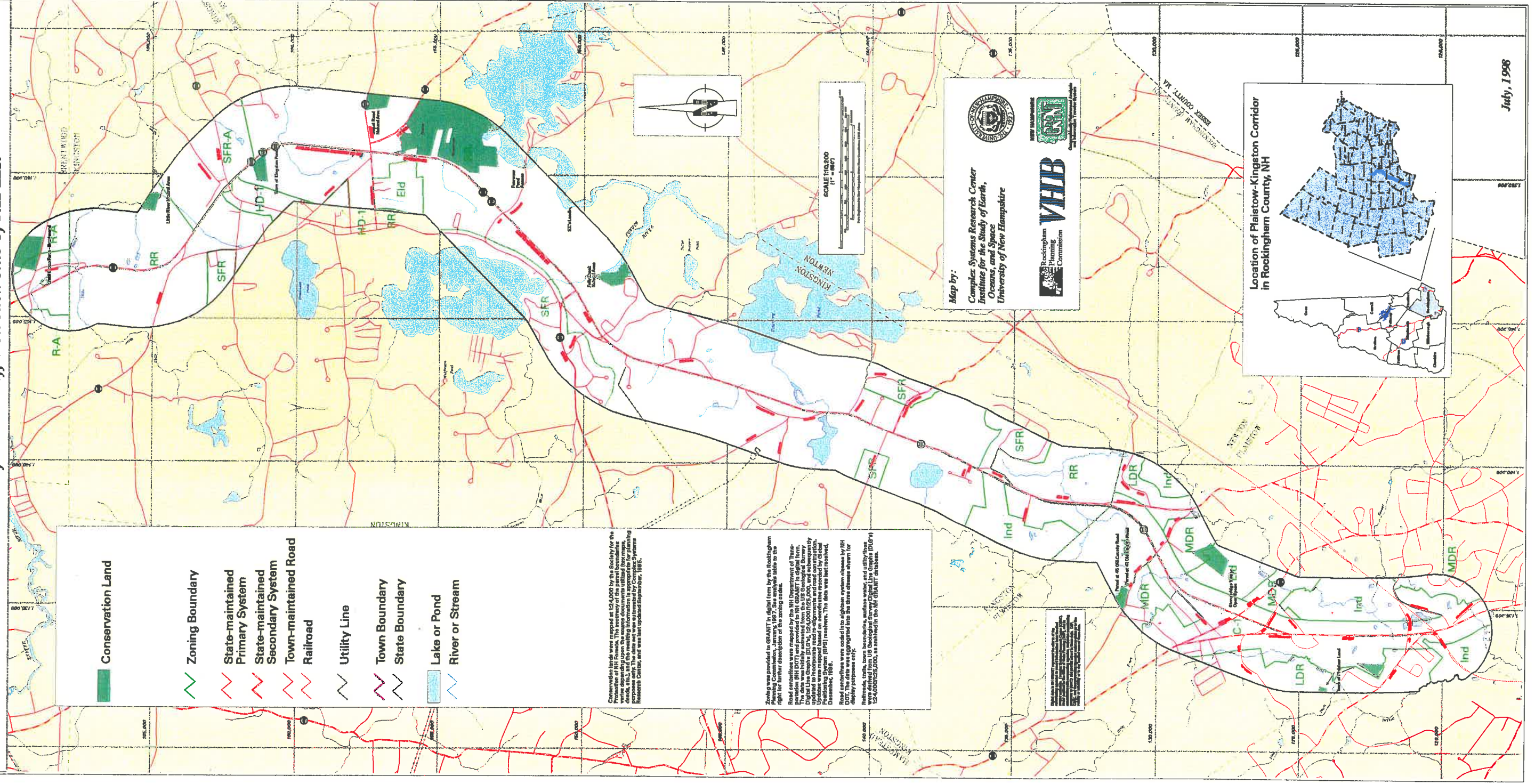


Figure 6

NH 125 Plaistow-Kingston Corridor

Feasibility Study - Buildout Analysis

Corridor consists of a 2000' buffer on each side of NH 125.

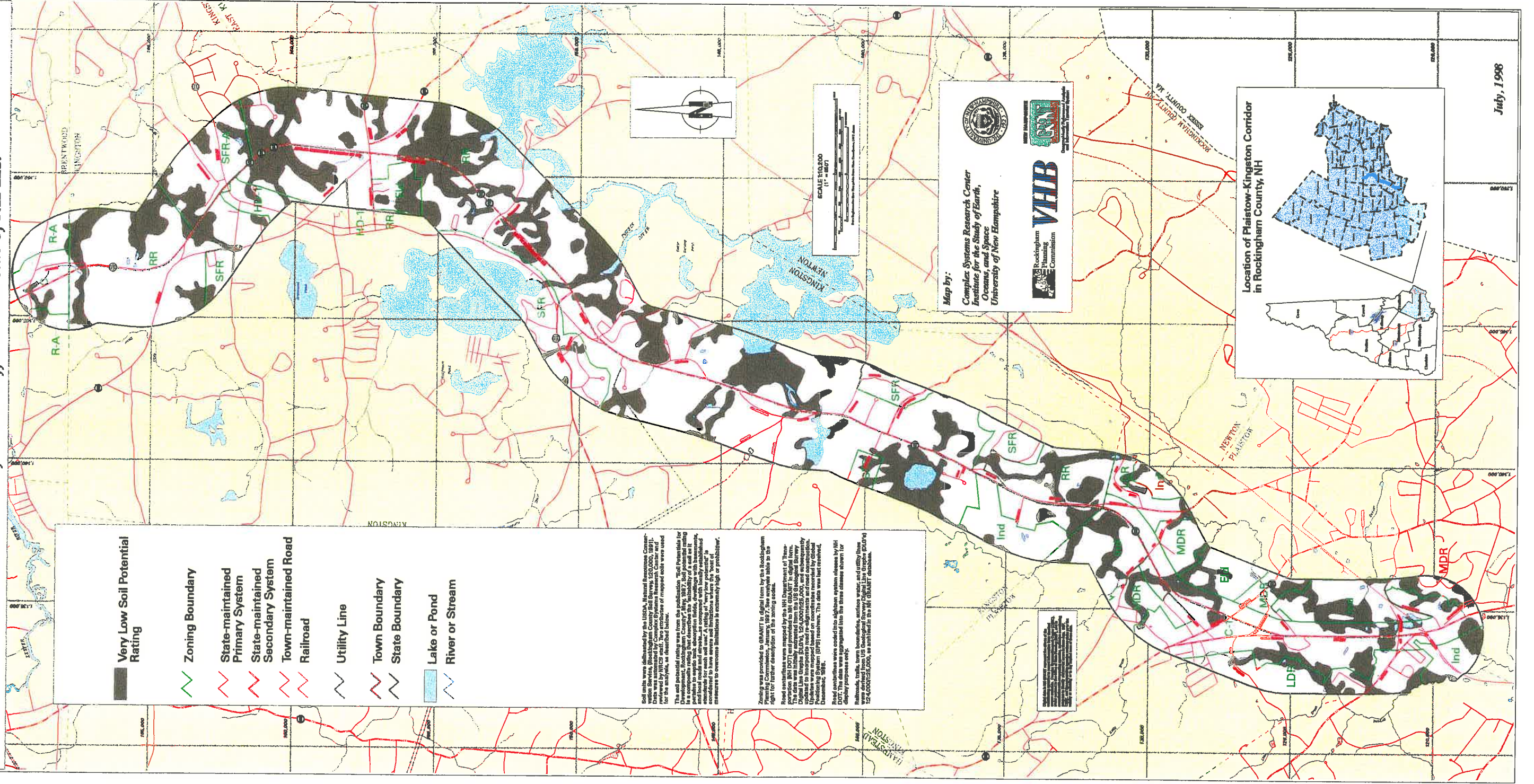


Figure 7

receive regarding transportation facilities. The town also maintains an active Highway Safety Committee which explicitly reviews and comments on highway access and safety components of development proposals (and is represented on the TRC).

Provisions for Scattered and Premature Development

In addition to the impact fee provision of the Town Zoning Ordinance, the subdivision regulations provide for on and off-site facility improvements in certain cases. If the Planning Board determines that a development would be scattered or premature without the construction of special on or off-site improvements, it may require them as a condition of approval, including the following:

- Improvements to streets, including intersection reconstruction and or signalization;
- Construction/reconstruction of sidewalks where warranted by expected pedestrian traffic.

Road Construction Standards

Plaistow’s subdivision regulations include the following “Design Standards for Major Streets” (applicable to NH 125 if not superceded by NHDOT design standards):

General		At Intersections	
ROW	60 ft.	Min. Angle of intersecting streets	75°
Pavement	40 ft.	Min. centerline offset	125 ft.
Sight distance	500 ft.	Min radius	40 ft.
		Sight distance	500 ft.

Driveway Entrance Provisions

The town requires that all driveway entrances be shown on plans and developed in accordance with the NHDOT’s “Policy and Procedures for Driveways and their Access to the State Highway System.” The town’s regulation includes the following statement:

“In all cases the number of points of access to a given street shall be held to a minimum, preferably one, in order to reduce traffic hazards caused by turning movements and to ease the installation of traffic control devices when necessary.”

The town defers to the State in the issuance of driveway permits for all State highways. No additional local access permit is required as part of a subdivision or site plan approval.

PLAISTOW SITE PLAN REVIEW REGULATIONS

General

Plaistow's Site Plan Review Regulations govern the development of commercial and industrial development in the town of Plaistow. The regulations provide procedures for applications and plan reviews and general standards related to landscaping, drainage, parking, driveways and access, screening, waste water disposal, and other concerns. There are no specific regulations related to the use of frontage roads, traffic impacts, special setbacks or other standards for the NH 125 corridor.

In general, site plans must comply with all applicable standards and procedures of the Subdivision Regulations, which are the basis for site plan review as well. Two additional areas for review are specifically called out: "The aesthetically pleasing development of the municipality and its environs", and, "Green spaces of adequate proportions."

Required improvements related to screening, site layout, traffic impact, parking, curbing and sidewalks are required at the expense of the applicant. Approval by the Planning Board may indicate any stipulation or condition that may be necessary to secure the public health, safety and welfare.

Additional Requirements Related to Roadways

In addition to the standards contained in the subdivision regulations, site plan review requires the following design consideration regarding traffic:

- Traffic access to the site must be designed to ensure the safety of vehicles and pedestrians;
- Improvement of existing streets must include installation of signal devices, if necessary, to mitigate traffic impacts;
- A circulation plan of the interior site must be included, showing provisions for auto and pedestrian circulation. Extensive off-street parking standards are included.

In addition, the Planning Board is to ensure, among other things, that the site plan provides adequate screening from adjacent residential properties. The Board may require installation of public improvements including curbing, sidewalks and landscape plantings.

KINGSTON MASTER PLAN

Kingston's current master plan was prepared in 1986 with updates scheduled in 1997 and 1998. The 1986 plan includes a section on transportation that defines the existing highway network, traffic volumes, street and highway conditions, and current projects and needs in Kingston. In separate chapters, the town outlines its general development policies, as well as those specific to transportation. Currently, the Planning Board is updating the Master Plan and intends to incorporate elements of the NH 125 Corridor Feasibility Study into the Transportation section of that Plan.

At the writing of the 1986 Master Plan, the NH 125 corridor was not the focal point of interest for the town. The main transportation issue was the heavy truck traffic and excessive speeds being encountered in the center of town because NH Route 111 was coterminous with Main Street. In 1996, NHDOT completed construction of a short connector between NH 111 and NH 125 that bypasses traffic around the Kingston town center, thus resolving this issue. Another issue likely to be addressed in the Master Plan update concerns the ongoing safety issues along the NH 125 corridor. The Town's Highway Safety committee has detailed several intersections along the corridor that have had high accident rates and as a result efforts are being undertaken to increase the safety of these sites. Some of these concerns are being or have been addressed through the MPO/NHDOT Transportation Improvement Program (TIP) process and/or through the NHDOT's Betterment program. Others will not be fully addressed until implementation of projects recommended in this study.

Other broader issues concerning future development along NH 125 have come to the forefront lately and will undoubtedly be addressed in the Master Plan update:

- The desire to accommodate and plan for anticipated widening, signalization and/or reconstruction of sections of NH 125;
- The desire to discourage and avoid commercial strip development patterns along the undeveloped portions of NH 125 in Kingston;
- The interest in encouraging the development of a limited number of service roads adjacent or parallel to NH 125 to permit partial development of the large areas of undeveloped land along the corridor, while avoiding the traffic problems associated with highway commercial development;
- The recognition that greater development on NH 125 will place greater demand on town services, especially public safety services.

KINGSTON ZONING ORDINANCE

General

The current Kingston Zoning Ordinance establishes seven (7) conventional use districts and various overlay districts. NH 125 passes through or is adjacent to six (6) of the conventional zoning districts: (See Zoning Districts shown on Figure 2). However of the six (6) districts that are adjacent to the corridor only rural residential and the Industrial zone have direct access in uncontrolled segments of the corridor. The other zones are adjacent to or directly access the corridor but are in areas defined as controlled access by the NHDOT and therefore have little potential for development with direct access to NH 125. The zones so affected include the Historic District, Single Family Residential-Agricultural, Housing for the Elderly and Single Family Residential.

Rural Residential (RR)
Single-Family Residential - Agriculture (SFR-A)
Single-Family Residential (SFR)
Historic District 1 (HD-1)
Housing for Elderly District (Eld)
Industrial (Ind)

District Provisions

The specific requirements of the Rural Residential and Industrial districts regarding permitted uses and dimensional requirements are shown in Table 1, "Zoning District Summary – Plaistow and Kingston". The locations of all six zones are shown on the above referenced zoning map. The specific requirements of the zoning and various overlay districts as they relate to potential development within the NH 125 Corridor are summarized in Table 1.

The Rural Residential District encompasses all areas of the town except for the other designated districts. In general, all uses are permitted except as otherwise prohibited or regulated by other provisions of the zoning ordinance, as well as the site plan and subdivision regulations. No specific purpose of the zone is identified; however, the ordinances general purposes apply. They include lessening congestion, promoting safety, and facilitating a good transportation system, preserving the rural character of the community, and permitting reasonable growth while conserving important resources. This zone encompasses approximately 3,666 acres of the 4,787 acres, or about 76 percent of the

study area within Kingston. The standard lot size in the district is 80,000 SF and has a minimum building setback of just 20 feet, except along NH 125, as noted below.

The Industrial zone is a relatively small district located in the southwestern most section of the Kingston portion of the study area. Approximately 145 acres of the district falls within the study area. The zone obtains access to NH 125 through a relatively narrow strip of about 800' located west of Old Road. The intent of the zone is "to encourage business growth and industrial installations in a campus like arrangement in the vicinity of important highways." Minimum lot size in the Industrial Zone is 120,000 SF with a minimum setback of 125' from State highways.

Overlay Zones

The town has four overlay zones which impact development within the NH 125 corridor: Wetlands Conservation District; Floodplain Development District; Aquifer Protection District; Shoreland Protection District. These function as overlay zones and exist wherever the natural conditions occur that defines them. Wetlands (poorly and very poorly drained soils) and Flood Hazard Areas (100-Year Floodplain) and Aquifers are depicted for the study area on Figures 3, 4, and 5 respectively. Building activity is prohibited in all defined wetland areas. Road and utility access ways are permitted subject to review. In the Floodplain Development District, building is permitted, but only if protected from flooding conditions. Residential buildings must be elevated above the 100-year flood elevation; non-residential buildings must be flood-proofed. In the Aquifer Protection District the minimum lot size is increased to 130,680 SF and maximum lot coverage is decreased to 20 percent for residential and 35 percent for commercial uses. A number of uses considered to have high risk of groundwater contamination are prohibited. The Shoreline Protection District establishes 150' and 300' setbacks from the Town's Great Ponds and from the Pow Wow and Little Rivers, within which certain uses are prohibited due to their risk for generating contaminated surface water runoff, and within which all building construction is subject to conditional approval. Taken together, these zones have a significant impact on development potential within the study area, especially because of the large area of wetland and aquifer overlay areas present.

Special Provisions

Impact Fees: In 1991 the town established an impact fee system to recover from new development a proportionate share of capital improvement cost for schools and roads. However, the scope of road projects includes only the "town-owned and maintained road system and rights-of-way," so it has limited applicability for the NH 125 corridor (except for town-owned side streets).

Special Setbacks for NH 125: In 1997 the town adopted new building setback standards for all development on NH 125. This was done in response to a multi-town/multi-region effort to begin looking at future widening needs for NH 125 in all towns in the corridor, from Rochester to Plaistow. The relevant section reads as follows:

The building setback for new construction for properties located along NH Route 125 shall be one hundred (100) feet as measured from the centerline of NH Route 125. Expansions to existing structures shall not encroach beyond the existing building footprint. For purposes of this section, parking areas, signage, fencing and landscaping treatments are permitted within the 100-foot setback distance. Septic systems are not permitted within the 100-foot setback distance.

KINGSTON SUBDIVISION REGULATIONS

General

Kingston's Subdivision Regulations govern the subdivision of land in Kingston to assure the town of high standards of subdivision layout, design and construction. They are also intended to ensure the timely installation of necessary improvements and for the payment of such improvement costs and finally, to aid the town and its Planning Board in carrying out the objectives of the town's Master Plan. The subdivision regulations include provisions for application and review procedure, approval procedures, septic system design, road and street design, water supply and drainage, and provisions for easements, public sites and open spaces, and floodplain development regulations. These regulations can have a significant impact on new development within the NH 125-corridor study area.

Purposes and Standards Related to Roadways

Of relevance to the NH 125 corridor, the purposes and general standards of the Subdivision regulations include:

Purposes

- to guide public and private policy and action in order to provide adequate and efficient transportation, water sewage, schools, parks, and other public facilities;
- to provide the most beneficial relationship between uses of land and buildings and the circulation of traffic throughout the town, having particular regard to the avoidance of congestion in the streets and highways, and the pedestrian traffic movements appropriate

to various uses of land and buildings, and to provide for the proper location and width of streets;

- to ensure that public facilities are available and will have a sufficient capacity to serve the proposed subdivision.

Standards

- Subdivisions are not allowed if they will result in scattered and premature development whereby the lack of adequate water supply, transportation, schools, fire protection or other public services would necessitate excess public expenditures;
- Subdivisions proposed on land that is not suitable for the intended purpose and which would result in increased danger to public health and safety will not be permitted.

Road Construction Standards

Kingston’s subdivision regulations include the following design standards and are applicable to NH 125 if not superceded by NHDOT design standards:

General		At Intersections	
ROW	60 ft.	Min. Angle of intersecting streets	60°
Pavement	26 ft.	Min. centerline offset	125 ft.
Sight distance	200 ft.	Min radius	20 ft.
		Sight distance	200 ft.
Grades			
Major street	<5%		
Minor street	<8%		

Layout of Streets

Relevant special standards governing the layout of streets include the following:

- The arrangement of streets must provide for the continuation of principle streets in adjoining subdivisions;
- The Planning Board may require the developer to make off-site improvements where need is attributed to the subdivision;
- Streets entering opposite sides of another street shall be laid out either directly opposite one another or with a minimum offset of 125 ft.;

Driveway Entrances

Relevant standards governing driveway entrances include the following:

- The arrangement of streets must provide for the continuation of principle streets in adjoining subdivisions;
- Driveways shall be offset from adjoining property lines by at least 20 ft.;
- 400 foot site distances are required, or the Planning Board will make determination of safest location; in these cases, just one driveway per lot may be allowed;
- Each building lot shall be serviced by its own driveway, but no more than two driveways, entrances, exits or approaches will be allowed on a single lot;
- Corner lots in subdivisions bordering existing town or state roads must access from the subdivision street, not the main road.

KINGSTON SITE PLAN REVIEW REGULATIONS

General

Kingston's Site Plan Review Regulations govern the development of commercial and industrial development. The regulations provide procedures for applications and plan reviews and general standards related to landscaping, drainage, parking, driveways and access, screening, waste water disposal, and other concerns. Approval by the Planning Board may indicate any stipulation or condition that may be necessary to secure the public health, safety and welfare.

In general, site plans must comply with all applicable standards and procedures of the Subdivision Regulations, which are the basis for site plan review as well. As with Plaistow’s site plan regulations, additional emphasis is placed on landscaping, screening and buffering, for the purpose of insulating residential uses from non-residential development. In addition, an extensive section is included in Kingston’s regulations pertaining to used car dealerships.

There are no specific regulations related to the use of frontage roads, traffic impacts, or standards for the NH 125 Corridor.

Additional Requirements Related to Roadways

In addition to the standards and procedures contained in the subdivision regulations, site plan review requires the following design consideration regarding traffic:

- Sufficient off-street parking and loading areas is required for the anticipated demand, so that no parking or loading maneuvers occur on public streets;
- Sidewalks must be provided for pedestrian traffic to provide connections between establishments and to connect to parking areas on the site;
- The development must result in clearly defined entrances and exits; physical barriers to prevent parking or display of vehicles on the public right of way.

The Planning Board may also require screening and buffering for both visual and noise impacts attributed to the development.

Traffic Volumes

To determine the existing traffic volume demands and flow patterns along the corridor, an extensive traffic volume count program was conducted during the month of November 1996. Weekday morning (7:00 - 9:00 AM) and weekday evening (4:00 - 6:00 PM) peak period manual turning movement counts were conducted at 14 intersections. To supplement the turning movement counts, 24-hour automatic traffic recorder counts were conducted at several key locations within the study area. A summary of the automatic traffic recorder count data is presented in Table 2.

As shown in the table, the November 1996 Average Weekday Traffic (AWDT) along NH 125 ranges from a low of approximately 13,100 vehicles per day (vpd) north of Old Coach Road to a high of 22,800 vpd north of East Road. Side street roadways such as Marshall Road (Route 107) and Newton Junction Road recorded AWDTs of approximately 4,000 vpd and 3,200 vpd respectively.

TABLE 2
Existing Traffic Volume Summary (November 1996)

	Average Weekday Traffic Volume (vpd)	AM Peak Hour (vph)	Percent of Daily Traffic	PM Peak Hour (vph)	Percent of Daily Traffic
KINGSTON					
NH 125 south of Marshall Road	13,800	1,030	7.5	1,070	7.8
Marshall Road north of NH 125	4,000	290	7.3	370	9.3
NH 125 south of Depot Road	13,900	1,070	7.7	1,070	7.7
New Boston Road west of NH 125	1,600	140	8.8	180	11.3
New Boston Road east of NH 125	2,300	170	7.4	220	9.6
NH 125 north of Old Coach Road	13,100	970	7.4	1,020	7.8
Old Coach Road north of Mill Road	100	10	10.0	10	10.0
Old Coach Road south of Mill Road	1,300	90	6.9	120	9.2
Hunt Road west of NH 125	2,000	170	8.5	170	8.5
Newton Junction Rd east of NH 125	3,200	280	8.8	270	8.4
NH 125 south of Newton Junction Rd.	15,500	1,000	6.5	1,200	7.7
PLAISTOW					
NH 125 south of Old County Road	14,000	840	6.0	1,070	7.6
Old County Road east of NH 125	1,600	110	6.9	140	8.8
NH 125 south of Main Street	15,400	830	5.4	1,150	7.5
Danville Rd north of Jesse George Rd	11,100	830	8.2	830	8.2
Jesse George Road west of NH 125	1,600	210	13.1	120	7.6
NH 125 North of east Road	22,800	1,290	5.7	1,760	7.8

Examination of the daily traffic volume variations at two locations along NH 125 (south of Depot Road in Kingston and south of Old County Road in Plaistow) during the month of November 1996 revealed little variation during the weekdays with the daily volume ranging from 13,000 vpd to 14,900 vpd. At both locations, the Sunday volume was recorded as the low volume day with a volume ranging from 10,000 vpd to 10,700 vpd. As would be

expected, with a greater concentration of retail activity in Plaistow, the Plaistow location recorded a somewhat higher volume (14,000 vpd to 12,300 vpd) on Saturday. The daily variations at the two locations are depicted in Figures 8 and 9.

FIGURE 8

Daily Traffic Variations in November
NH 125 Corridor in Kingston

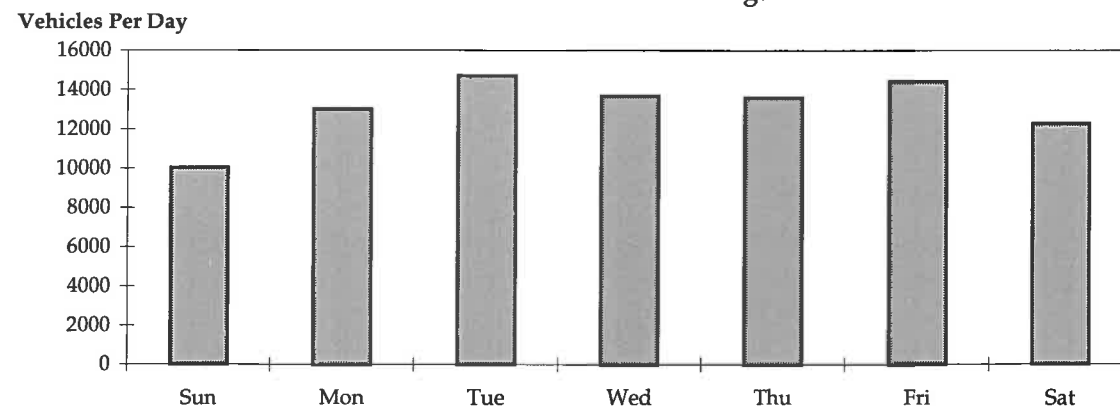
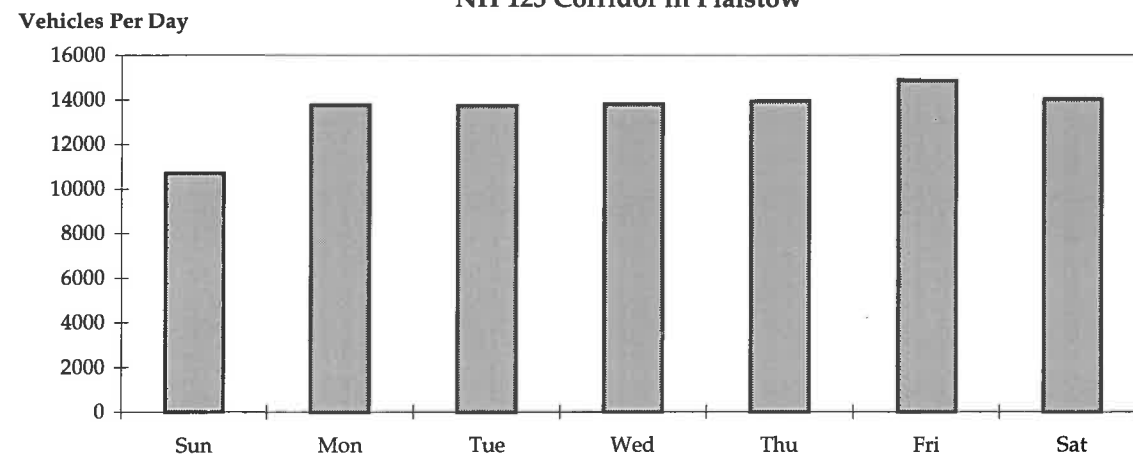


FIGURE 9

Daily Variations in November
NH 125 Corridor in Plaistow



A breakdown of the hourly variations for a typical weekday (Thursday 11/14/96) at the same two locations along the corridor revealed markedly different trends. The Kingston location exhibited typical commuter route characteristics with the highest volumes of the day occurring during the 7:00 to 8:00 AM and 5:00 to 6:00 PM commuter peak periods. Conversely, the Plaistow location revealed a moderate peak during the morning commuter period, while the influence of business activity along the southern segment of the corridor sustains the volume of traffic throughout most of the weekday with peak traffic volumes

recorded between 2:00 PM and 6:00 PM. The hourly variations at the two locations are depicted in Figures 10 and 11.

FIGURE 10

Hourly Variations on an
Average Weekday in November
NH 125 Corridor in Kingston

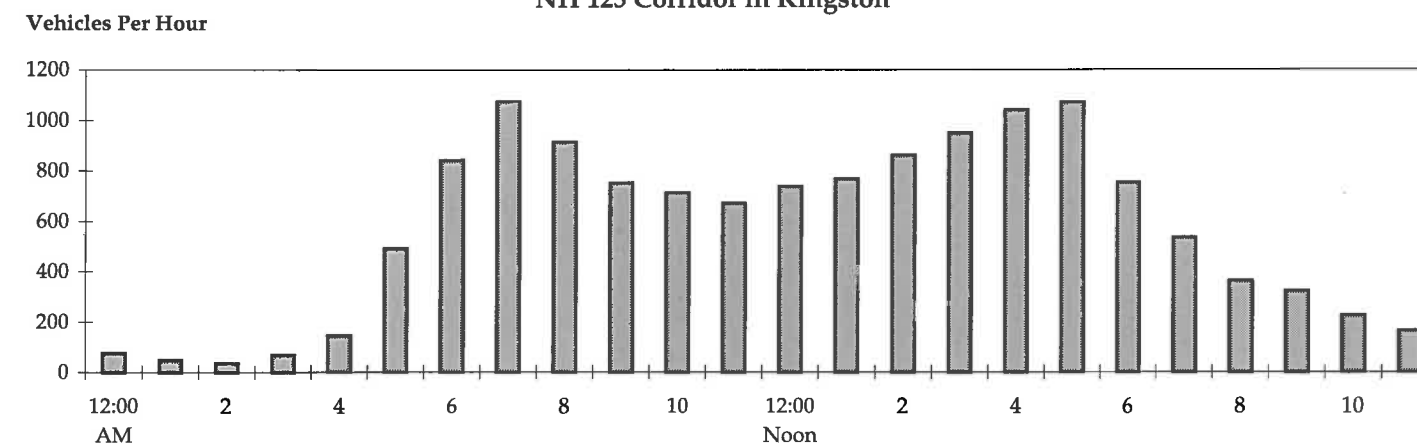
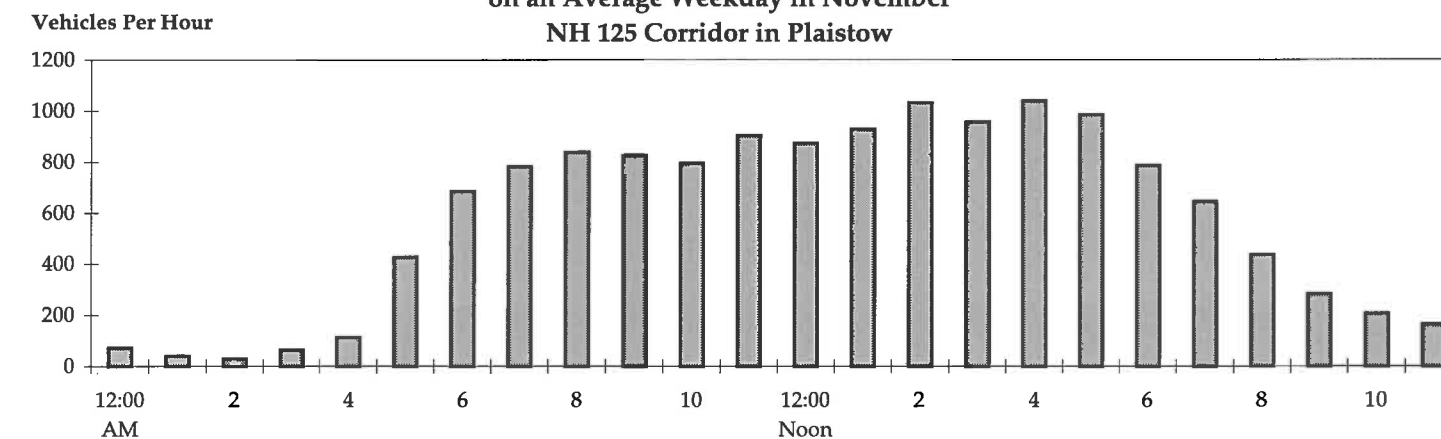


FIGURE 11

Hourly Variations
on an Average Weekday in November
NH 125 Corridor in Plaistow



An examination of historical traffic volume data collected by the New Hampshire Department of Transportation (NHDOT) at its permanent traffic recorder station located along NH 125 in Lee, revealed the thirtieth highest volume to be 21 percent higher than the traffic volumes recorded during the second week in November. The thirtieth highest design hour volume represents a condition equal to the thirtieth highest hourly volume for the entire year. Because of the economic considerations involved in the planning and design of

roadway facilities, state authorities, such as the NHDOT, usually select this design criteria since the thirtieth highest hourly volume generally reflects a “point of diminishing return” in that a substantial increase in design requirements would accommodate only a very few additional hourly volumes of traffic higher than the thirtieth highest hour. Therefore, to evaluate the existing travel demands along the corridor, the weekday AM and PM peak hour turning movement counts conducted in November were adjusted (21 percent increase) to reflect a thirtieth highest hour volume for the base year of 1996.

The 1996 weekday AM and PM traffic volume networks are shown in Figure 12.

Vehicle Speeds

Speed measurements were recorded along the corridor during the peak and off-peak periods of the day. The results of the speed measurements indicate that motorists tend to slightly exceed the posted speed limits. Average travel speeds recorded during the off-peak hours of the day range from 45 mph to 55 mph along the northern segment (Marshall Ave. to Old Coach Rd.), from 35 mph to 50 mph along the central segment (Old Coach Rd. to Kingston Rd.), and from 30 mph to 50 mph along the southern segment (Kingston Rd. to Joanne Dr.). Average travel speeds recorded throughout the corridor during the peak hour were measured at approximately 5 mph lower than the off-peak period.

Accident Research

Accident records provided by the towns of Kingston and Plaistow were reviewed and evaluated. The records provided by the town of Kingston cover the three-year period of 1993 through 1995 as well as the first nine months of 1996. During this period a total of 209 accidents were reported along the corridor in Kingston. The data provided by the town of Plaistow covers the four-year period of 1992 through 1995 as well as the first ten months of 1996. During this period a total of 170 accidents were reported within the study area in Plaistow. High accident locations - defined as averaging 5 or more accidents per year - include the intersections of Main Street (12 accidents per year), Route 111 (8 accidents per year), Hunt Road/Newton Junction Road (6 accidents per year), Route 107 (5 accidents per year), and New Boston Road (5 accidents per year).

Operational Analysis

Measuring traffic volumes within the study area indicates the importance of the corridor to the regional roadway system, but gives little indication of the quality of traffic flow. To measure the quality of traffic flow, key intersections and roadway segments were analyzed from an operational perspective. The results of this analysis provide a valid indication of how well the roadway system serves the travel demand placed upon it.

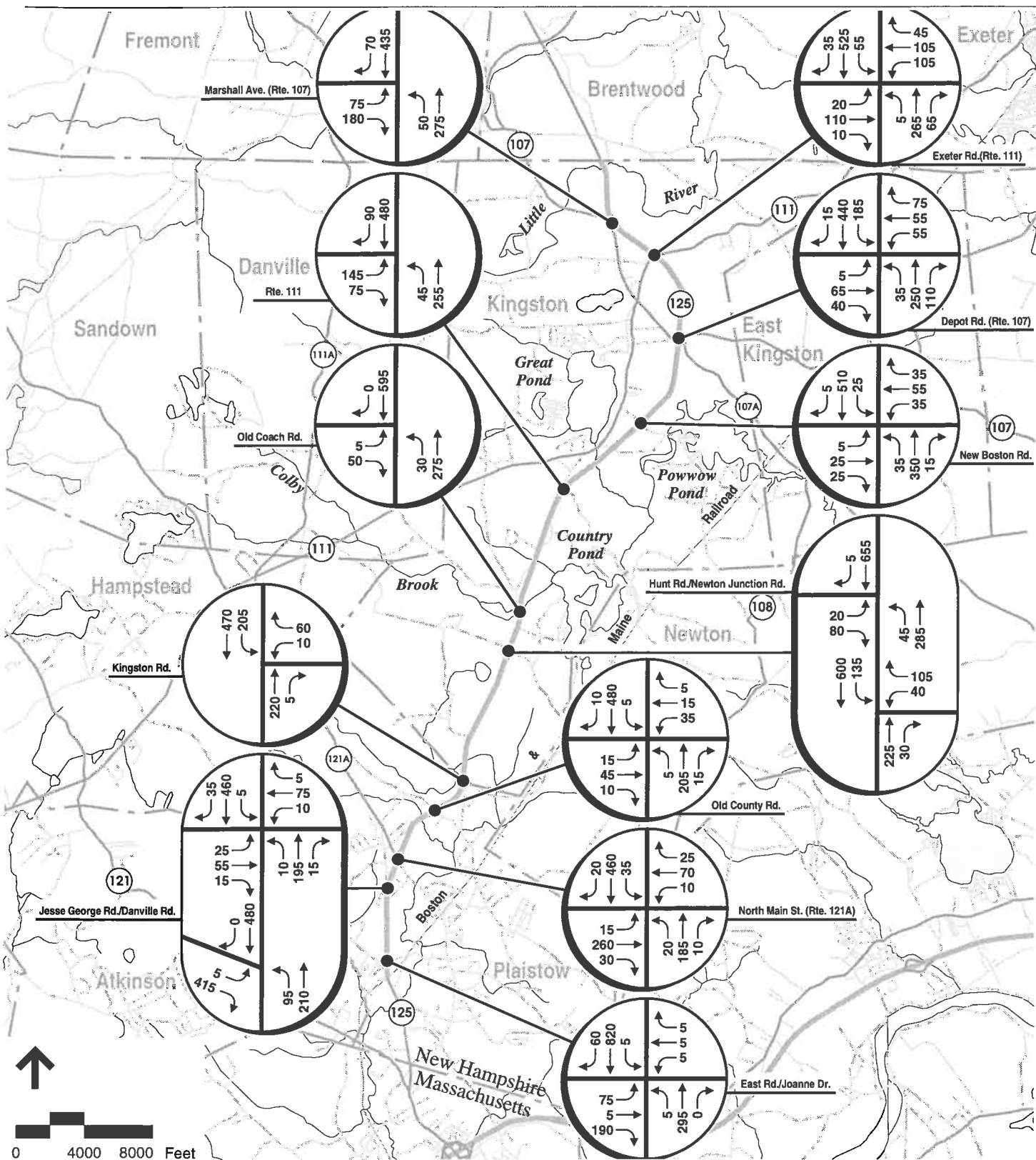
Level of service (LOS) is the term used to denote the different operating conditions which occur on a given roadway facility under various traffic volume loads. LOS is a qualitative measure of the effect of a number of factors including roadway geometrics, travel speed, travel delay, freedom to maneuver, and safety. Level of service provides an index to the operational qualities of a roadway segment or intersection. The evaluation criteria contained in the 1994 Highway Capacity Manual¹ (HCM) were used to analyze the signalized and unsignalized study area intersections, and the corridor roadway segments.

Level of service is based on a grading system where LOS “A” is the best condition and LOS “F” is the worst condition. In general terms, intersection movements operating at LOS “A” or LOS “B” experience very little if any delay. Levels of service “C” and “D” are typically considered average delay conditions. LOS “E” and “F” suggests that motorists experience long delays. The level of service designation is reported differently for signalized and unsignalized intersections. For signalized intersections, the analysis considers the operation of all traffic entering the intersection and the LOS designation is for the overall conditions at the intersection. The analysis criteria for unsignalized intersections are based on the expected average delay to side street movements.

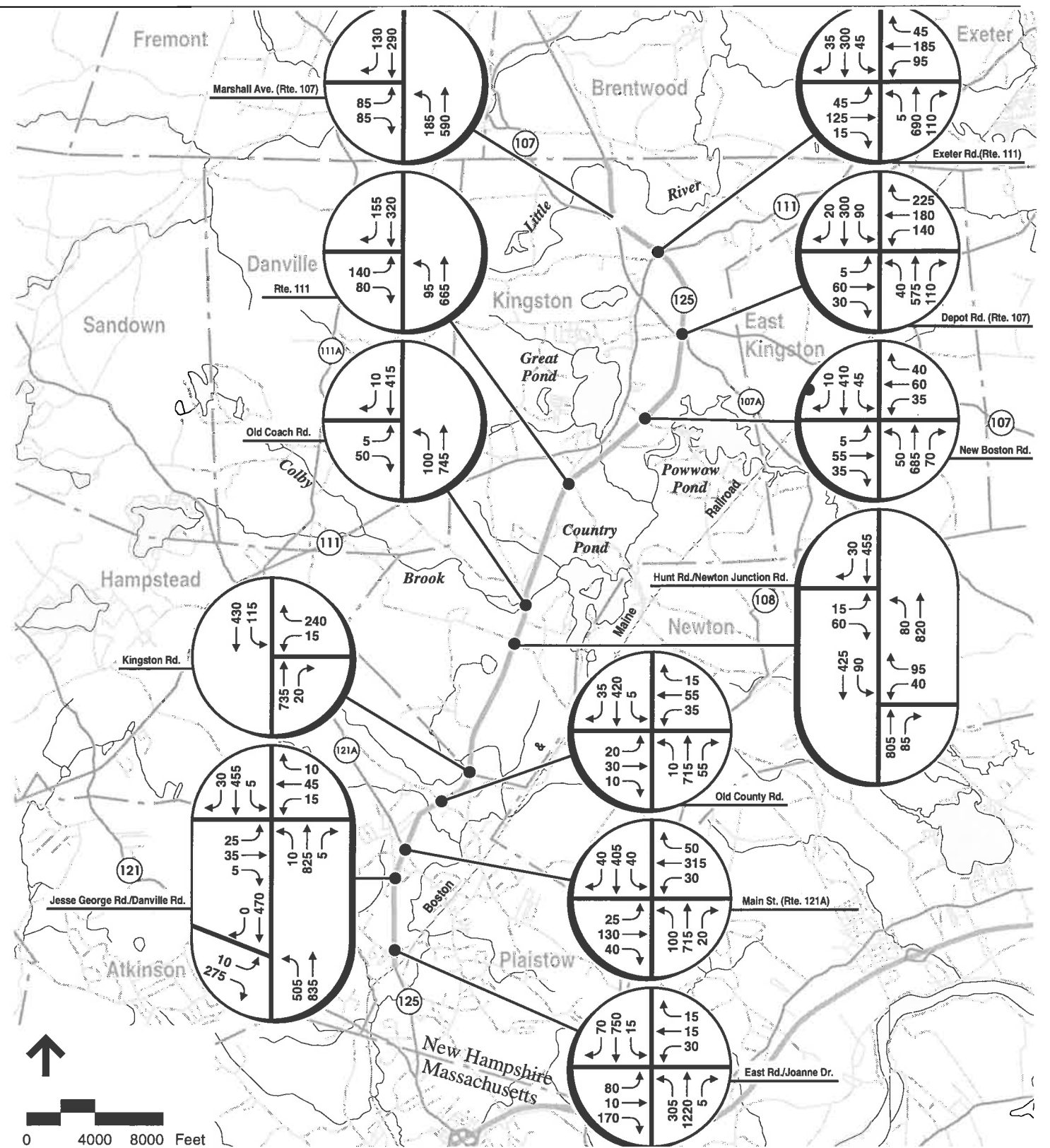
The results of the signalized intersection analyses conducted for the 1996 base year reveal relatively good operating levels of service in the areas where recent improvement projects have been constructed, such as the intersections of Route 111 (Exeter Road), Route 107 (Depot Road) and the new Route 111 intersection. Each of the three intersections operates at LOS B during the morning and the evening peak periods. The East Road/Joanne Drive intersection operates at LOS B during the AM peak hour and LOS C during the PM peak hour. The signalized Main Street intersection, which is limited to single lane approaches, operates at LOS B during the AM and LOS D - with a volume-to-capacity ratio of 1.0 - during the PM peak hour.

The results of the unsignalized intersection analyses indicate that the left-turn exiting movements from most of the corridor side streets operate at poor levels of service (LOS E or F). Operationally deficient movements include the left-turn exiting movements from Marshall

¹Highway Capacity Manual, Special Report 209; Transportation Research Board, Washington, DC (1994).



Weekday Morning Peak Hour



Weekday Evening Peak Hour

Vanasse Hangen Brustlin, Inc.

Figure 12
1996 Base Traffic Volumes

NH 125 Plaistow/Kingston
Feasibility Study

Road (Route 107), New Boston Road, Newton Junction Road, Old County Road, Jesse George Road, and Danville Road.

An evaluation of the roadway segments along the NH 125 revealed that the northern segments of the corridor (north of Old Coach Road) operate at LOS D, while the central and southern segments (south of Old Coach Road) operate at LOS E.

The results of the signalized intersection, unsignalized intersection, and roadway link analyses are summarized in Tables 3, 4, and 5.

TABLE 3
Signalized Intersection Capacity Analysis
1996 Base Condition

Intersection	Analysis Period	V/C	Delay	LOS
KINGSTON				
NH 125 at Route 111 (Exeter Road)	AM	0.61	12	B
	PM	0.72	14	B
NH 125 at Route 107 (Depot Road)	AM	0.60	12	B
	PM	0.69	13	B
NH 125 at Route 111 (New Connection)	AM	0.55	9	B
	PM	0.64	8	B
PLAISTOW				
NH 125 at Main Street	AM	0.69	10	B
	PM	1.00	37	D
NH 125 at East Road/Joanne Drive	AM	0.51	9	B
	PM	0.88	16	C

v/c – Volume to capacity ratio

Delay – Average intersection delay expressed in seconds

LOS – Level of service

TABLE 4
Unsignalized Intersection Analysis
1996 Base Condition

Intersection	AM			PM		
	Demand	Delay	LOS	Demand	Delay	LOS
KINGSTON						
<u>NH 125 at Rt. 107 (Marshall Rd)</u>						
Left from NH125	50	4	A	185	4	A
Left from NH107	75	17	C	85	55	F
Right From NH107	180	6	B	85	4	A
<u>NH 125 at New Boston Road</u>						
Left from NH125 NB	35	4	A	50	4	A
Left from NH125 SB	25	3	A	45	6	B
Left/Thru/Right from New Boston Rd EB	55	12	C	95	46	F
Left/Thru/Right from New Boston Rd WB	125	28	D	135	127	F
<u>NH 125 at Old Coach Road</u>						
Left from NH125	30	4	A	100	4	A
Left/Right from Old Coach Road	55	8	B	55	9	B
<u>NH 125 at Hunt Road</u>						
Left from NH 125	45	6	B	80	4	A
Left/Right from Hunt Road	100	11	C	75	15	C
<u>NH 125 at Newton Junction Road</u>						
Left from NH 125	135	4	A	90	9	B
Left/Right from Newton Junction Road	150	12	C	135	109	F
PLAISTOW						
<u>NH 125 at Kingston Road</u>						
Left from NH 125	205	4	A	115	6	B
Right from Kingston Road	60	4	A	240	12	C
Left from Kingston Road	10	10	B	15	19	C
<u>NH 125 at Old County Road</u>						
Left from NH 125 NB	5	4	A	10	4	A
Left from NH 125 SB	5	3	A	5	5	B
Left/Thru/Right from Old County Road EB	70	11	C	60	34	E
Left/Thru/Right from Old County Road WB	55	13	C	105	42	E
<u>NH 125 at Jesse George Road</u>						
Left from NH 125 NB	10	4	A	10	4	A
Left from NH 125 SB	5	3	A	5	5	B
Left/Thru/Right from Jesse George Road EB	95	18	C	65	57	F
Left/Thru/Right from Jesse George Road WB	90	14	C	70	36	E
<u>NH 125 at Danville Road</u>						
Right from Danville Road	415	12	C	275	3	B
<u>NH 125 at Danville Road Ext.</u>						
Left/Thru from Danville Road Ext.	95	8	B	505	45	E

TABLE 5
Roadway Link Analysis
1996 Base Condition

Roadway Segment	Analysis Period	Flow Rate	Service Flow Rate	V/C	LOS
<u>KINGSTON</u>					
NH 125 between Depot Rd and New Boston Rd	AM	1,043	2,240	0.47	D
	PM	1,328	2,483	0.53	D
NH 125 between Rt. 111 and Old Coach Rd	AM	972	2,200	0.44	D
	PM	1,289	2,450	0.53	D
NH 125 between Newton Junction Road and Plaistow T/L	AM	994	2,319	0.43	D
	PM	1,506	2,474	0.61	E
<u>PLAISTOW</u>					
NH 125 between Kingston T/L and Kingston Road	AM	1,061	2,265	0.47	D
	PM	1,689	2,453	0.69	E
NH 125 between Main St and Jesse George Rd	AM	806	2,179	0.37	D
	PM	1,456	2,501	0.58	E
NH 125 between Danville Rd and East Rd/Joanne Drive	AM	1,400	2,329	0.60	E
	PM	2,389	2,567	0.93	E

Field Observations

In addition to inventorying the corridor's physical roadway conditions, conducting traffic volume counts, measuring travel speeds, and researching accident records, general field observations were conducted. These field observations consisted of both driving and walking the study corridor in an effort to better understand and appreciate corridor deficiencies and community concerns. The following are some of the observations noted.

- Lack of access control - The numerous uncontrolled curb-cuts along the corridor not only adversely impact the efficient flow of traffic along the corridor but create a potentially hazardous and confusing condition as motorists enter and exit the corridor.
- Absence of exclusive left-turn lanes - Given the relatively high travel speeds, commercial vehicle use, numerous curb cuts, and turn movement activity, the current lack of protected left-turn lanes at several corridor intersections can be potentially hazardous. These locations include Old Coach Road, Hunt Road, Newton Junction Road, Kingston Road, Old County Road, and Main Street.

- Lack of illumination - Several corridor intersections currently are poorly lit or have no illumination. Some of these intersections include Exeter Road (Route 111), Depot Road (Route 107), New Boston Road, Colonial Road, Kingston Road, Old County Road, and Jesse George Road.
- Poor intersection definition - The corridor's relatively strait alignment combined with the numerous curb cuts and side streets, as well as the relatively narrow side street roadway widths and corner radii contribute to the lack of visual definition at the major intersections along the corridor. Turn movements at relatively high volume intersections such as New Boston Road, Old Coach Road, Kingston Road, Old County Road, Main Street, and Jesse George Road are often unexpected by motorists traveling along the corridor.
- Poor intersection alignment - Several corridor roadways, particularly loop roads such as Meeks Road, Old Coach Road, and Colonial Drive intersect the corridor at skewed angles or at locations where sight distance is limited due to the rolling vertical alignment of NH 125.

Findings and Interim Improvements

The results of the existing conditions inventory and evaluation revealed a number of operational, safety, and access related deficiencies. From an operational standpoint, each of the recently improved signalized intersections operates at a good level of service. The signalized Main Street intersection, however, currently operates close to or at capacity during the weekday evening peak hour. In addition, the left-turn exiting movements from most of the corridor's unsignalized side street intersections operate at poor levels of service (LOS E or F).

From a safety perspective, the absence of turn lanes, the insufficient illumination, the existence of poor alignment and sight lines, and the lack of intersection definition likely each contribute to the relatively high accident occurrence along the corridor.

Addressing many of the corridor deficiencies will involve the development of a long-range vision for the corridor. However, to begin to address some of the existing corridor deficiencies, a series of interim improvements are recommended.

The proposed interim improvements are as follows:

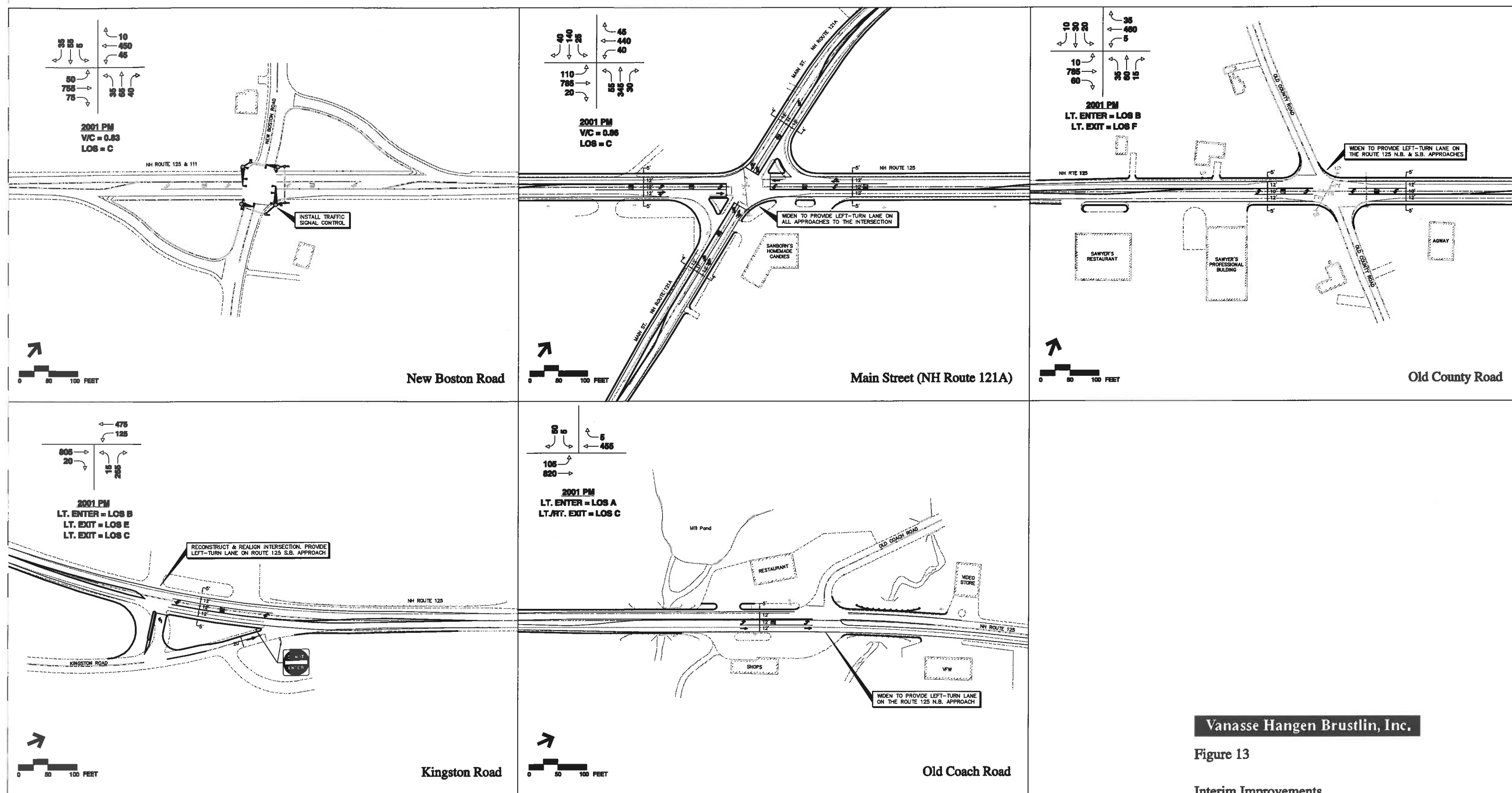
- Install traffic signal control at the New Boston Road intersection.
- Provide an exclusive left-turn lane on the NH 125 northbound approach at Old Coach Road.

- Reconstruct and realign the Kingston Road intersection to create a more typical T-type intersection. Provide an exclusive left-turn lane on the NH 125 southbound approach.
- Widen NH 125 at Old County Road to provide exclusive left-turn lanes on the northbound and southbound approaches to the intersection.
- Widen NH 125 and Main Street to provide exclusive left-turn lanes on all four approaches to the intersection.
- In addition to the physical roadway modifications, improved illumination should be provided along the corridor. Specific intersections include Exeter Road (Route 111), Depot Road (Route 107), New Boston Road, Colonial Road, Kingston Road, and Jesse George Road.

All of the recommended interim improvement projects as identified in the study, with the exception of the Kingston Road realignment project, were recommended by the MPO for inclusion in the FY1999-2001 State Transportation Improvement Program and three (the New Boston Road, Old Coach Road, and Main Street projects) are scheduled for implementation within the next one to three years (1999-2001). The department has held Public Informational / Public Officials meetings in the appropriate communities to discuss proposed preliminary engineering designs and to solicit public input.

It is important to recognize that several other deficiencies exist at locations such as Hunt Road, Newton Junction Road, Jesse George Road, Danville Road, Meeks Road, and Colonial Road. Design improvements including access management techniques should be applied to these locations. However, any interim improvements at these locations would need to be consistent with the long-term vision and long-range plan for the corridor. The following section of this report develops the future traffic volume demands for the corridor, which form the basis for the development of the long-term vision and long-range improvement plan for the corridor.

The interim improvement plan is depicted in Figure 13.



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Figure 13

Interim Improvements

N.H. 125 Plaistow/Kingston
Feasibility Study

Future Conditions

To evaluate the impact of future travel demands along the study area corridor, the 1996 base traffic volumes were projected to a 20-year design horizon. To project future traffic volumes, it is necessary to consider both historical traffic growth trends as well as potential land development along the corridor. This section discusses the methodology used to project future traffic volume demand, and presents the results of an operational analysis conducted under the 20-year design volume condition.

Land Use Potential

An important consideration in assessing potential future land use changes along the NH 125 Corridor is the evaluation of future development potential. Such changes can and will effect the future traffic volumes and functionality of the highway. Future development is a function of at least two important factors: (1) what is **allowed** under existing zoning, land use regulations (as described previously) and highway access condition, and (2) what is **possible** given the physical characteristics of the undeveloped land adjacent to the highway.

A review of local zoning land use regulations in Plaistow and Kingston suggests that the zoning regulations are not a significant constraint on future development in Plaistow, but are in Kingston. Although further development will certainly be regulated as to type and design, a very broad range of uses is permitted in both towns. There are few constraints on the types of uses that will be most readily attracted to a busy highway corridor – retail commercial development. The most limiting constraints regarding regulation are found in Kingston’s Aquifer Protection District, which covers a large portion of the town’s segment of the corridor, and in the access limitations imposed by the NHDOT, which likewise covers a large segment of the highway in Kingston. The Aquifer Protection District covers over two-thirds of the study area in Kingston, and imposes a 3-acre minimum lot size, and a maximum lot coverage of 20 percent for residential and 35 percent for commercial uses. This will limit both the type and size of development likely to occur along the corridor in Kingston. The controlled access condition, which exists for approximately half of Kingston’s length of NH 125, prohibits new access points onto the roadway except by action of the Governor and Council. This will likewise restrict future development, at least to the extent that it relies on direct access to NH 125.

The second determinant of future land use potential is the development potential of the land itself. As part of this Feasibility Study, an evaluation of buildable land was conducted to

assess the build-out potential of the corridor. The analysis was done using geographic information system (GIS) maps and data from the State’s GRANIT map database as well as from the RPC’s GIS maps. The objective of the analysis was to determine the approximate number of acres of potential developable land within the study area. This was done by determining the total land area and subtracting from it the known conditions that would render the land “undevelopable”, as illustrated in the following table:

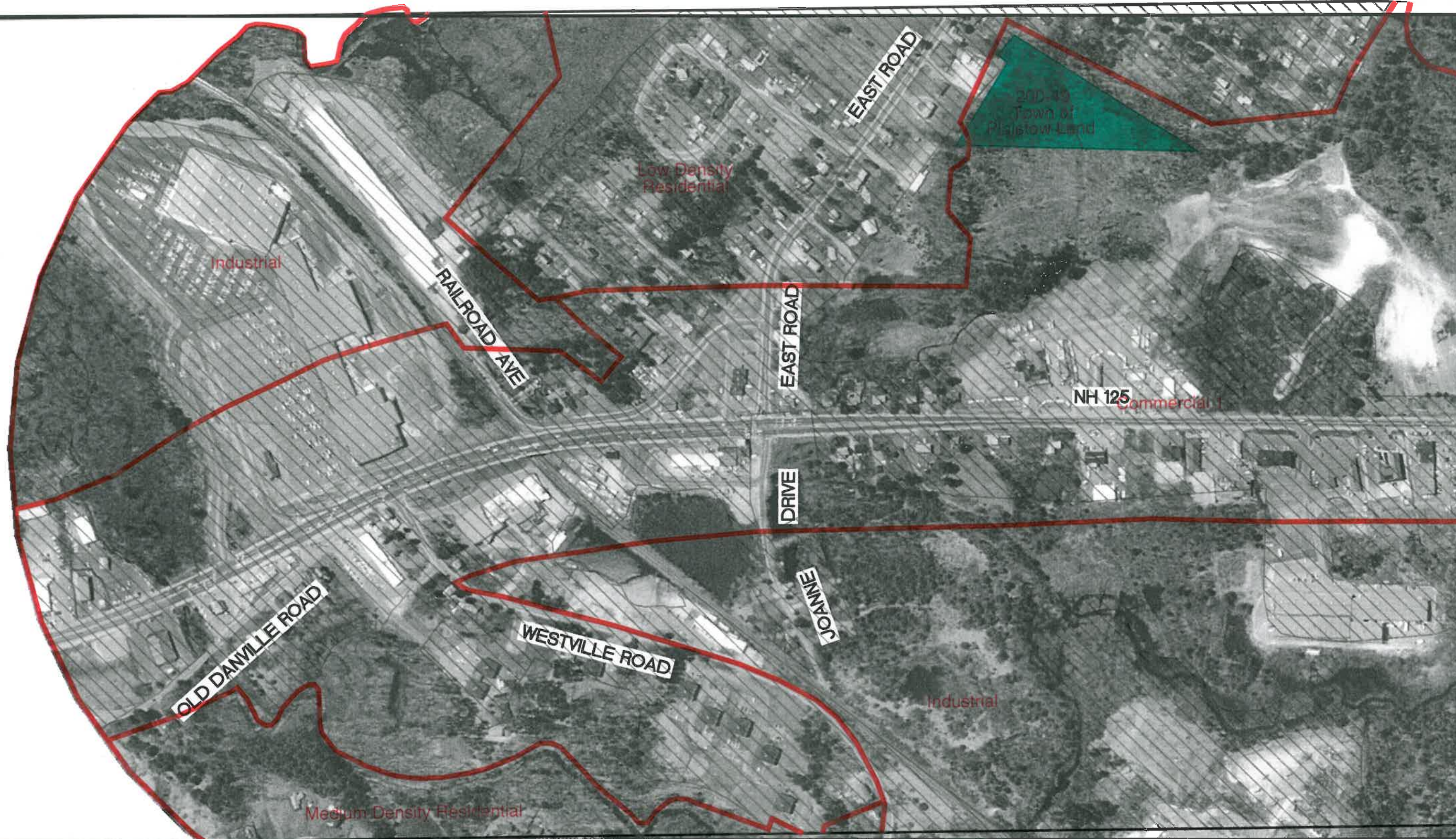
Table 6
Summary Results - Potential Developable Land

<i>Condition</i>	<i>Plaistow</i>	<i>Kingston</i>	<i>Total</i>
Total Land Area (study area)	1738.8 acres	4787.4 acres	6524.2 acres
Existing Developed Land (already in use)	-951.9	-1640.4	-2592.3 acres
Open Water	-10.3	-230.8	-241.1
Wetlands	-420.0	-1370.0	-1790
Conservation Land (no development allowed)	-36.6	-234.2	-270.8
Overlapping Conditions*	160	421.7	583.7
TOTAL POTENTIAL DEVELOPABLE (approximate)	480.0 acres	1733.7 acres	2213.7 acres

* some conditions partially overlap and therefore are counted twice as undevelopable (for example, conservation land may also be wetland)

The corridor constraints and zoning boundaries are depicted graphically on Figures 14 through 23. The various constraints (wetlands, very low soil potential, 100-yr. floodplain, developed land, and conservation land) and zoning boundaries are shown on the colored overlays.

As expected, given the greater existing development, Plaistow has fewer acres of developable land remaining – less than a third of Kingston’s. However, given the development restrictions in Kingston, the difference in future development potential is much less. Also, because of the high land values for both developed and undeveloped land, it is expected that as vacant land becomes scarce, some of the older existing uses will be “redeveloped” in more intensive ways.



**1996 BASE TRAFFIC VOLUMES
(NH 125 NORTH OF EAST STREET)**

AM PEAK HOUR 1,260 vph
PM 30TH HIGH HOUR 2,150 vph
ADT 22,800 vpd

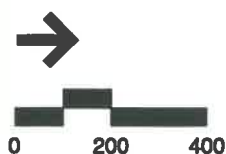
- POTENTIAL DEVELOPABLE LAND
- DEVELOPED LAND
- CONSERVATION LAND
- ZONING BOUNDARY

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Figure 14

Constraint Maps

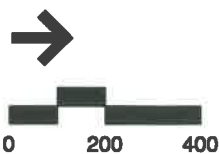
NH 125 Plaistow/Kingston
Feasibility Study









**1996 BASE TRAFFIC VOLUMES
(NH 125 NORTH OF EAST STREET)**

AM PEAK HOUR 1,260 vph
PM 30TH HIGH HOUR 2,150 vph
ADT 22,800 vpd



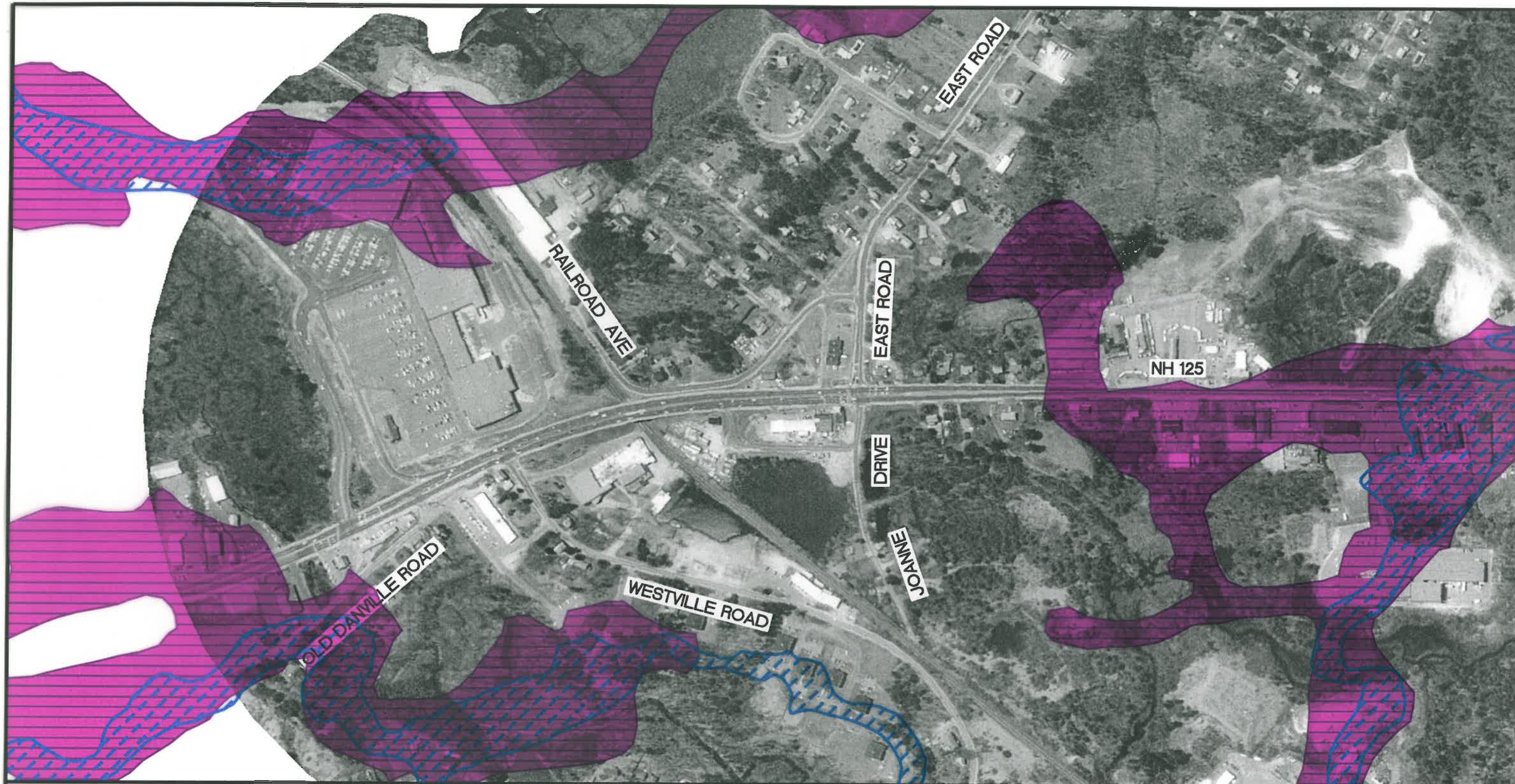
-  POTENTIAL DEVELOPABLE LAND
-  DEVELOPED LAND
-  CONSERVATION LAND
-  ZONING BOUNDARY

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Figure 14

Constraint Maps

NH 125 Plaistow/Kingston
Feasibility Study

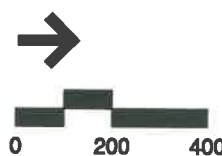


**1996 BASE TRAFFIC VOLUMES
(NH 125 NORTH OF EAST STREET)**

AM PEAK HOUR 1,260 vph
 PM 30TH HIGH HOUR 2,150 vph
 ADT 22,800 vpd

LEGEND:

- WETLAND
- VERY LOW SOIL POTENTIAL
- 100-YR FLOODPLAIN

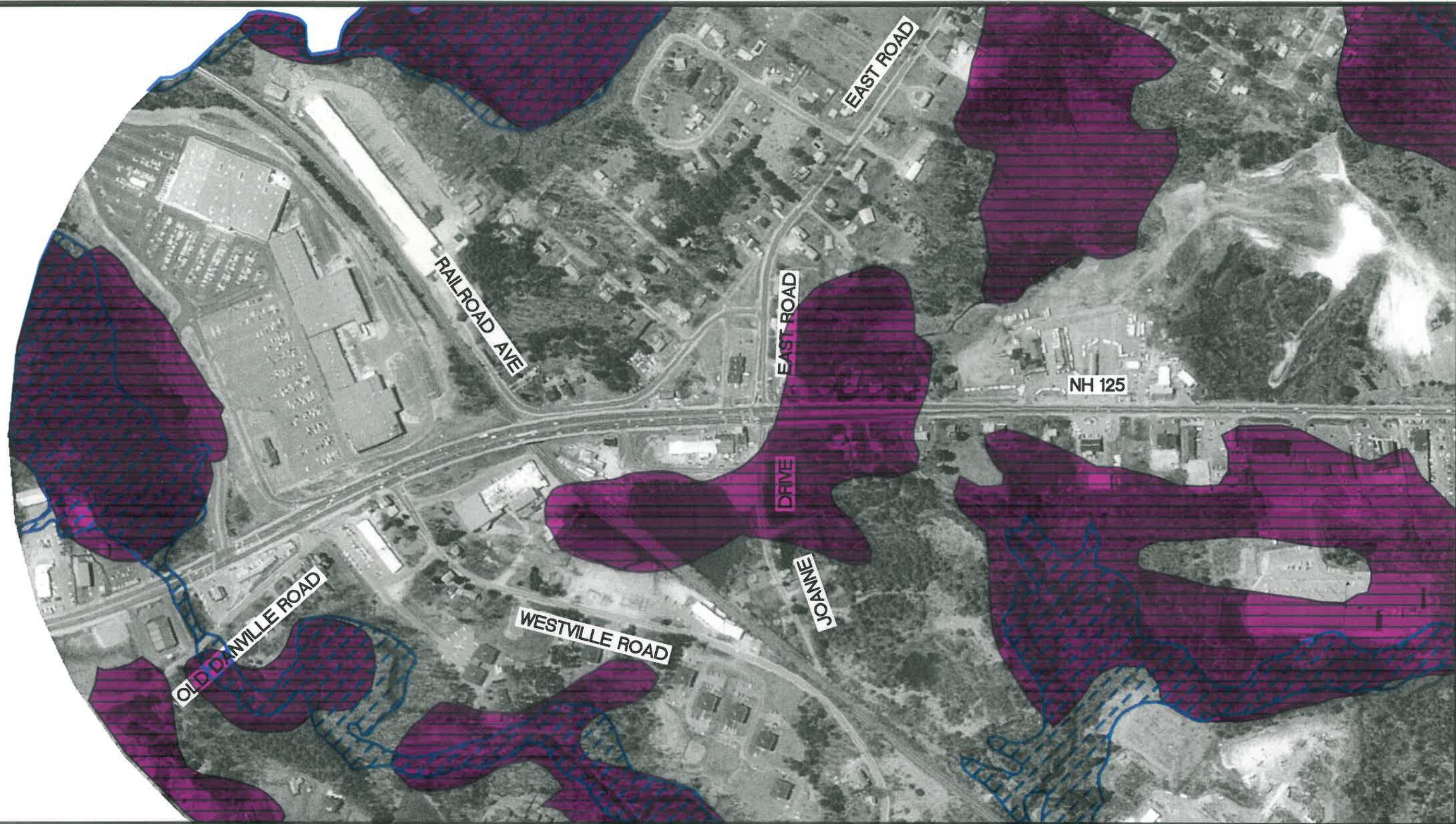


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Figure 14

Constraint Maps




NH 125 Plaistow/Kingston
 Feasibility Study



**1996 BASE TRAFFIC VOLUMES
(NH 125 NORTH OF EAST STREET)**

AM PEAK HOUR	1,260 vph
PM 30TH HIGH HOUR	2,150 vph
ADT	22,800 vpd

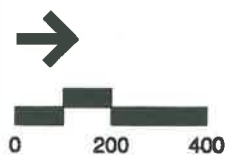
LEGEND:

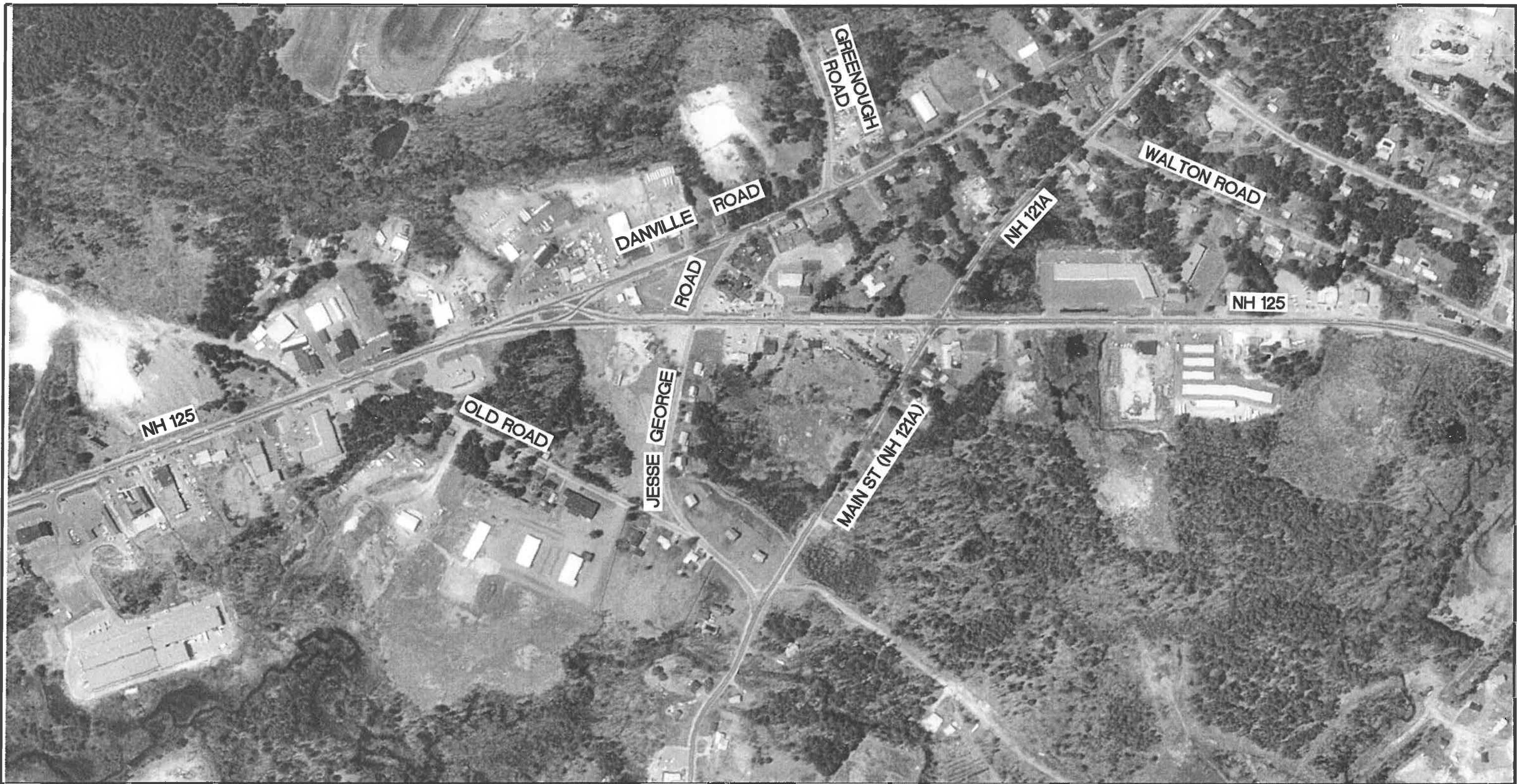
- | | |
|---|-------------------------|
|  | WETLAND |
|  | VERY LOW SOIL POTENTIAL |
|  | 100-YR FLOODPLAIN |

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Figure 14
Constraint Maps

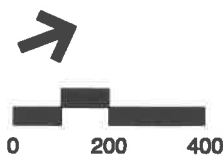
NH 125 Plaistow/Kingston
Feasibility Study





**1996 BASE TRAFFIC VOLUMES
(NH 125 NORTH OF JESSE GEORGE ROAD)**

AM PEAK HOUR	725 vph
PM 30TH HIGH HOUR	1,350 vph
ADT	15,400 vpd



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Figure 15
Constraint Maps

NH 125 Plaistow/Kingston
Feasibility Study



**1996 BASE TRAFFIC VOLUMES
(NH 125 NORTH OF OLD COUNTY ROAD)**

AM PEAK HOUR 720 vph
PM 30TH HIGH HOUR 1,210 vph
ADT 14,000 vpd

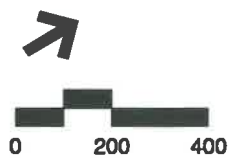
-  POTENTIAL DEVELOPABLE LAND
-  DEVELOPED LAND
-  CONSERVATION LAND
-  ZONING BOUNDARY

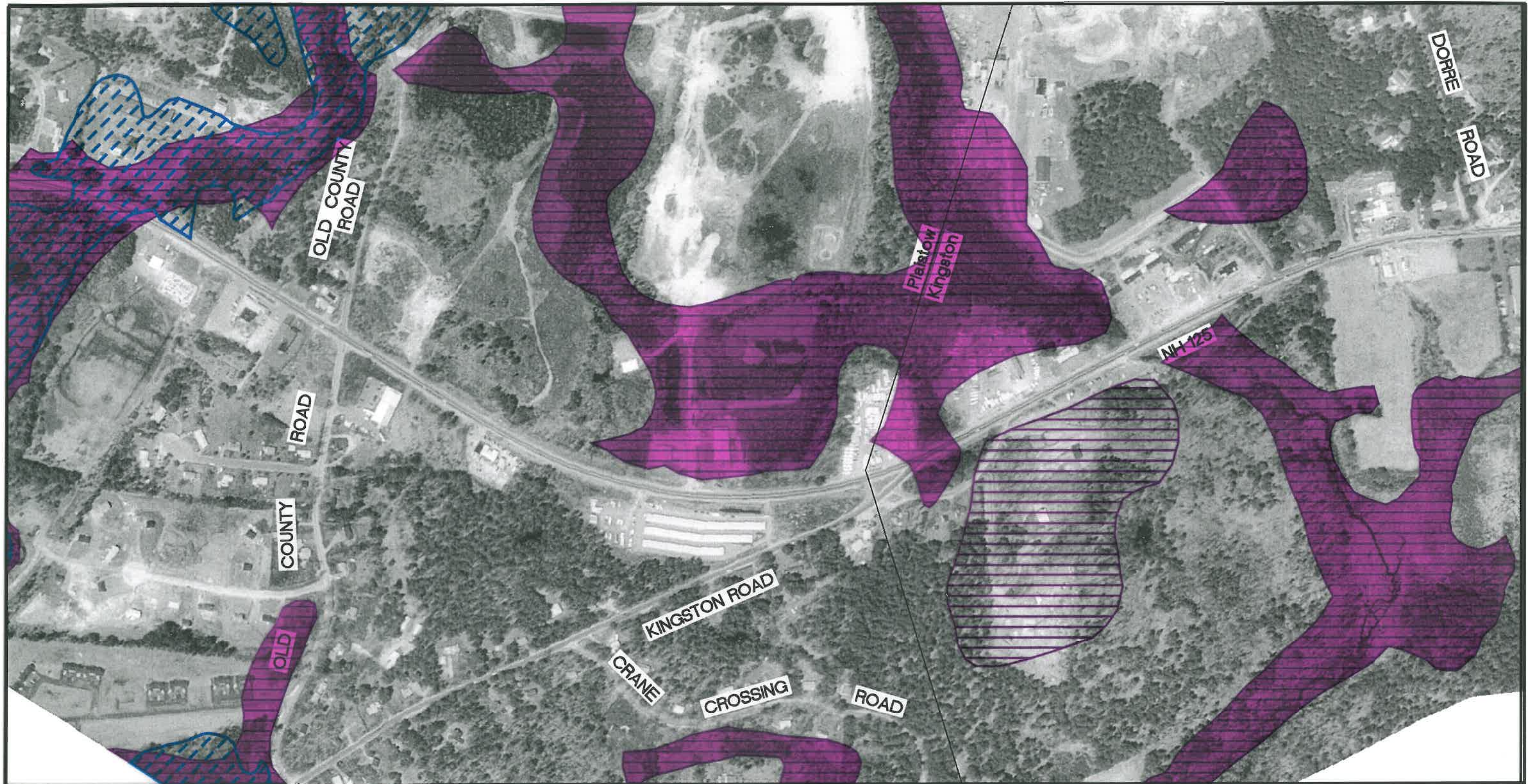
Vanasse Hangen Brustlin, Inc.

Figure 16

Constraint Maps

NH 125 Plaistow/Kingston
Feasibility Study





1996 BASE TRAFFIC VOLUMES
(NH 125 NORTH OF OLD COUNTY ROAD)

AM PEAK HOUR 720 vph
PM 30TH HIGH HOUR 1,210 vph
ADT 14,000 vpd

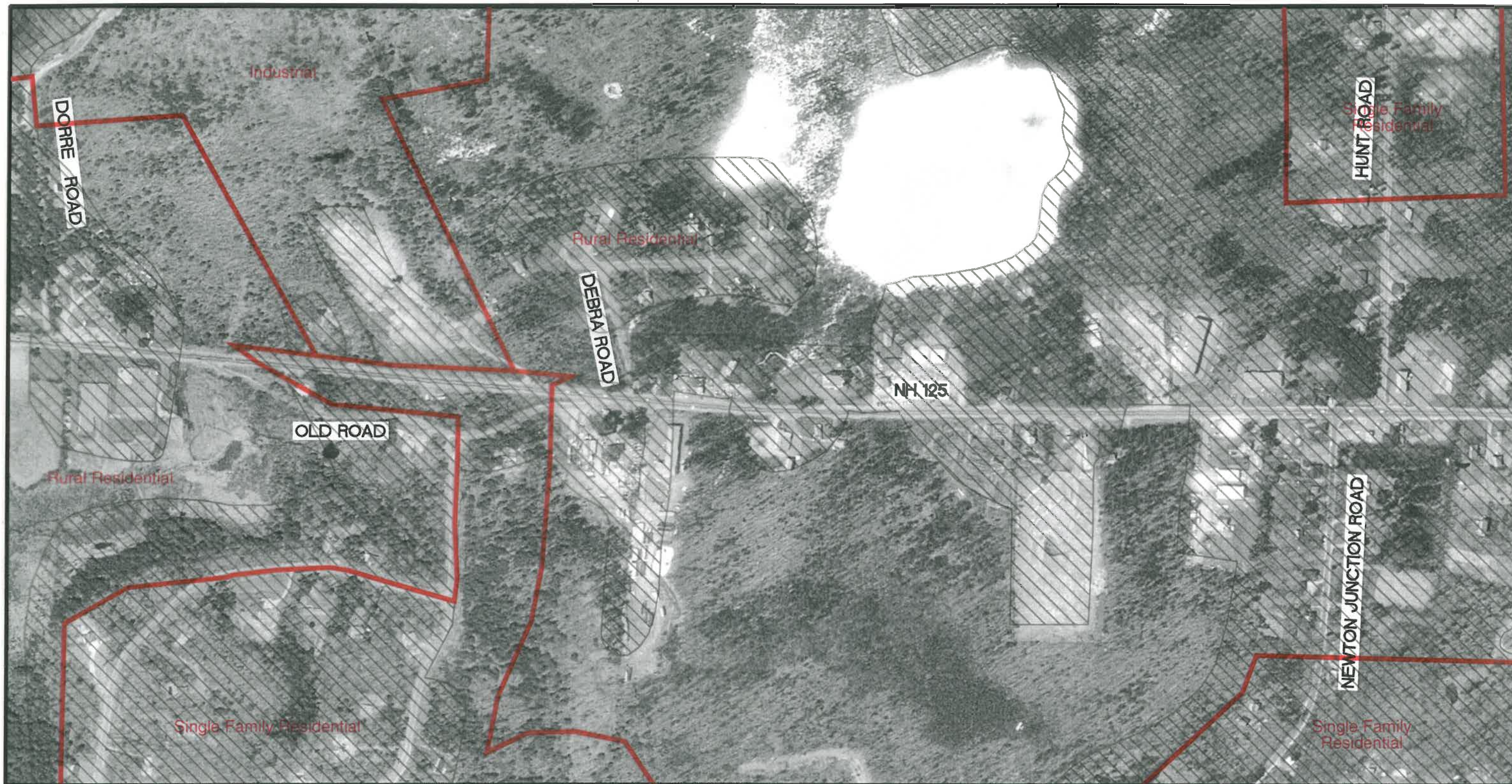
LEGEND:

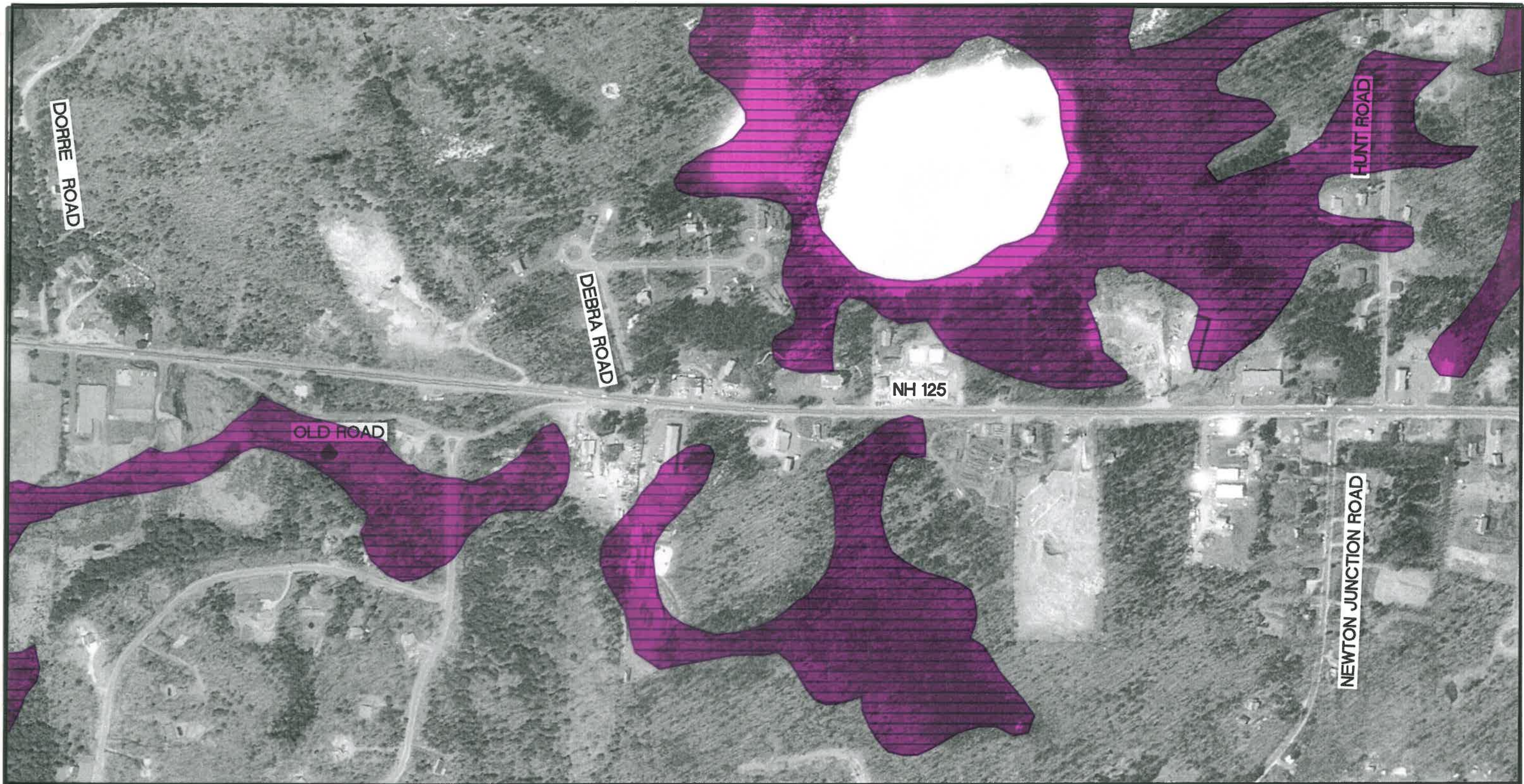
- WETLAND
- VERY LOW SOIL POTENTIAL
- 100-YR FLOODPLAIN

Vanasse Hangen Brustlin, Inc.

Figure 16
Constraint Maps

NH 125 Plaistow/Kingston
Feasibility Study



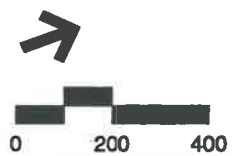


1996 BASE TRAFFIC VOLUMES
(NH 125 SOUTH OF NEWTON JCT. ROAD)

AM PEAK HOUR 895 vph
PM 30TH HIGH HOUR 1,355 vph
ADT 15,500 vpd

LEGEND:

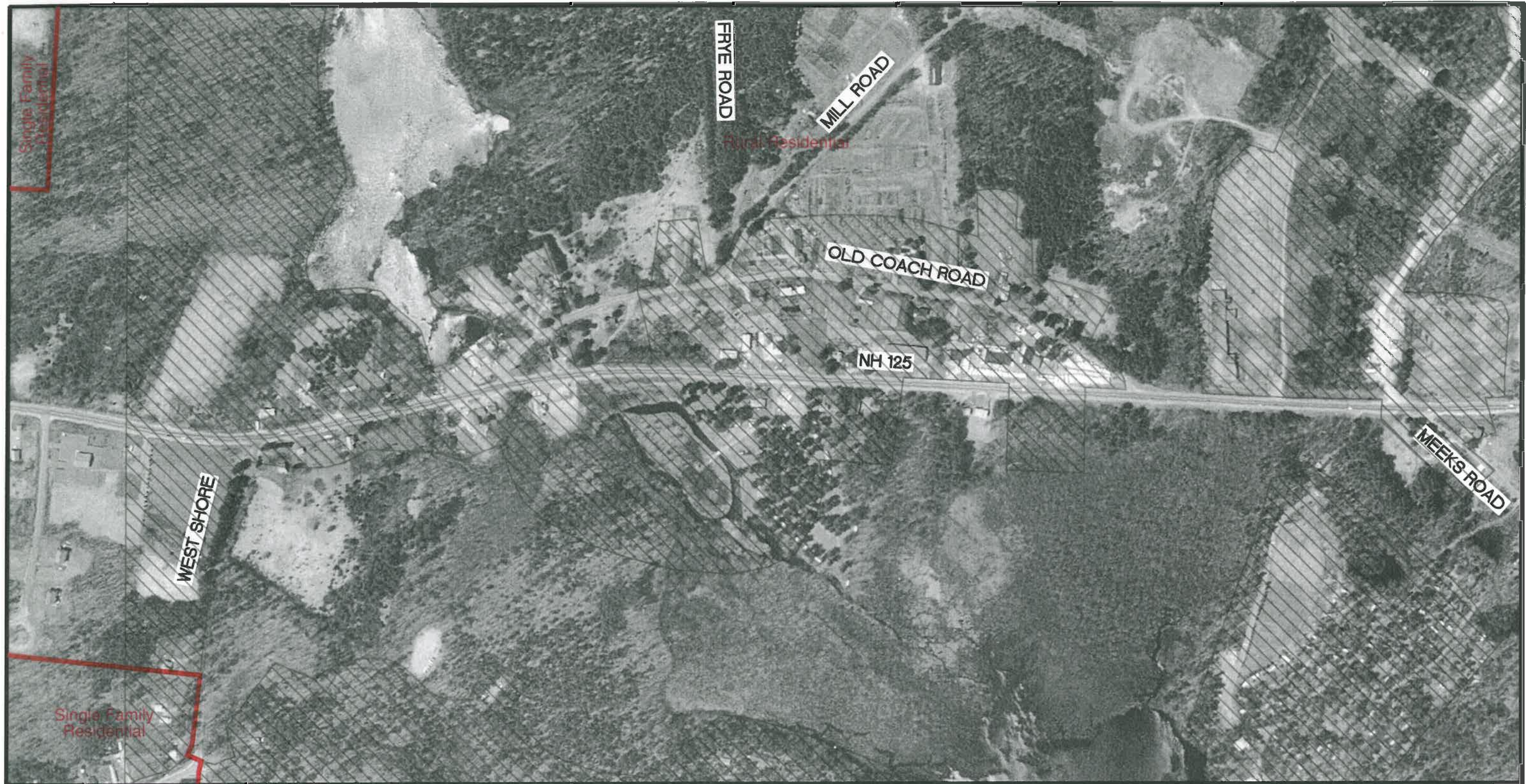
- WETLAND
- VERY LOW SOIL POTENTIAL
- 100-YR FLOODPLAIN



Vanasse Hangen Brustlin, Inc.




Figure 17
Constraint Maps

NH 125 Plaistow/Kingston
Feasibility Study



**1996 BASE TRAFFIC VOLUMES
(NH 125 NORTH OF OLD COACH ROAD)**

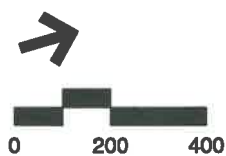
AM PEAK HOUR 875 vph
PM 30TH HIGH HOUR 1,175 vph
ADT 13,100 vpd

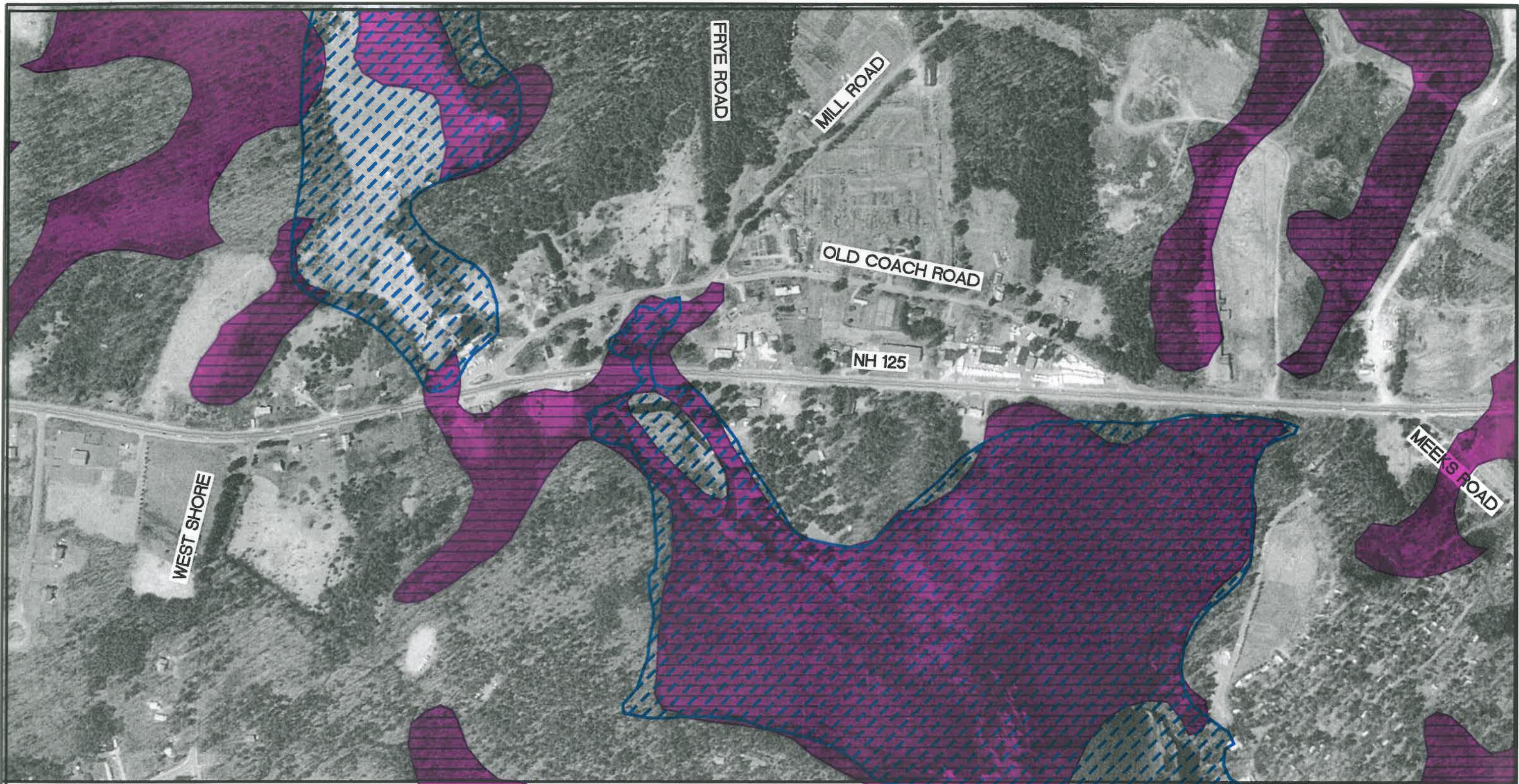
-  POTENTIAL DEVELOPABLE LAND
-  DEVELOPED LAND
-  ZONING BOUNDARY

Vanasse Hangen Brustlin, Inc.

Figure 18
Constraint Maps

NH 125 Plaistow/Kingston
Feasibility Study



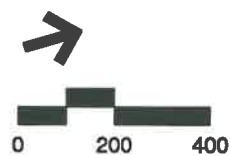


**1996 BASE TRAFFIC VOLUMES
(NH 125 NORTH OF OLD COACH ROAD)**

AM PEAK HOUR 875 vph
 PM 30TH HIGH HOUR 1,175 vph
 ADT 13,100 vpd

LEGEND:

- WETLAND
- VERY LOW SOIL POTENTIAL
- 100-YR FLOODPLAIN



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**Figure 18
Constraint Maps**

**NH 125 Plaistow/Kingston
Feasibility Study**



**1996 BASE TRAFFIC VOLUMES
(NH 125 SOUTH OF RTE 111 BY-PASS)**

AM PEAK HOUR 855 vph
PM 30TH HIGH HOUR 1,160 vph
ADT 13,100 vpd

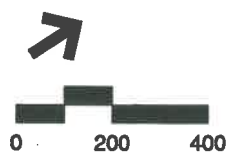
-  POTENTIAL DEVELOPABLE LAND
-  DEVELOPED LAND
-  CONSERVATION LAND
-  ZONING BOUNDARY

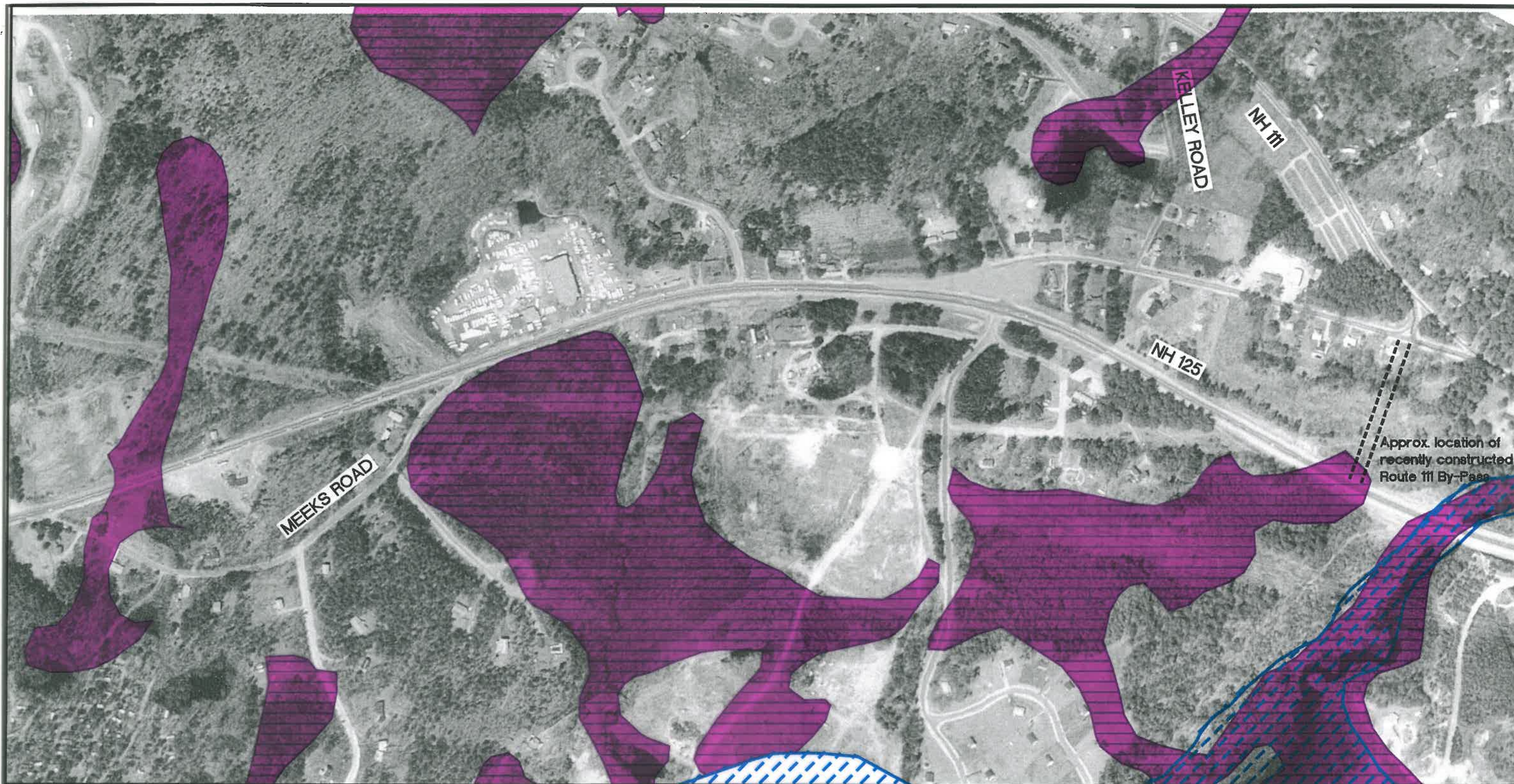
Vanasse Hangen Brustlin, Inc.

Figure 19

Constraint Maps

NH 125 Plaistow/Kingston
Feasibility Study





1996 BASE TRAFFIC VOLUMES
(NH 125 SOUTH OF RTE 111 BY-PASS)

AM PEAK HOUR 855 vph
PM 30TH HIGH HOUR 1,160 vph
ADT 13,100 vpd

LEGEND:

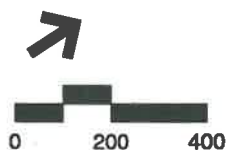
- WETLAND
- VERY LOW SOIL POTENTIAL
- 100-YR FLOODPLAIN

Vanasse Hangen Brustlin, Inc.

Figure 19

Constraint Maps

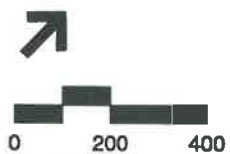
NH 125 Plaistow/Kingston
Feasibility Study









**1996 BASE TRAFFIC VOLUMES
(NH 125 SOUTH OF NEW BOSTON ROAD)**

AM PEAK HOUR 970 vph
PM 30TH HIGH HOUR 1,285 vph
ADT 14,600 vpd



-  POTENTIAL DEVELOPABLE LAND
-  DEVELOPED LAND
-  CONSERVATION LAND
-  ZONING BOUNDARY

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Figure 20

Constraint Maps

NH 125 Plaistow/Kingston
Feasibility Study



1996 BASE TRAFFIC VOLUMES
(NH 125 SOUTH OF NEW BOSTON ROAD)

AM PEAK HOUR 970 vph
PM 30TH HIGH HOUR 1,285 vph
ADT 14,600 vpd

LEGEND:

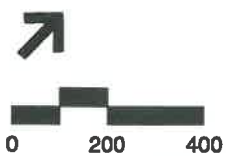
- WETLAND
- VERY LOW SOIL POTENTIAL
- 100-YR FLOODPLAIN

Vanasse Hangen Brustlin, Inc.

Figure 20

Constraint Maps





NH 125 Plaistow/Kingston
Feasibility Study





**1996 BASE TRAFFIC VOLUMES
(NH 125 SOUTH OF DEPOT ROAD)**

AM PEAK HOUR 930 vph
PM 30TH HIGH HOUR 1,195 vph
ADT 13,900 vpd

-  POTENTIAL DEVELOPABLE LAND
-  DEVELOPED LAND
-  CONSERVATION LAND
-  ZONING BOUNDARY

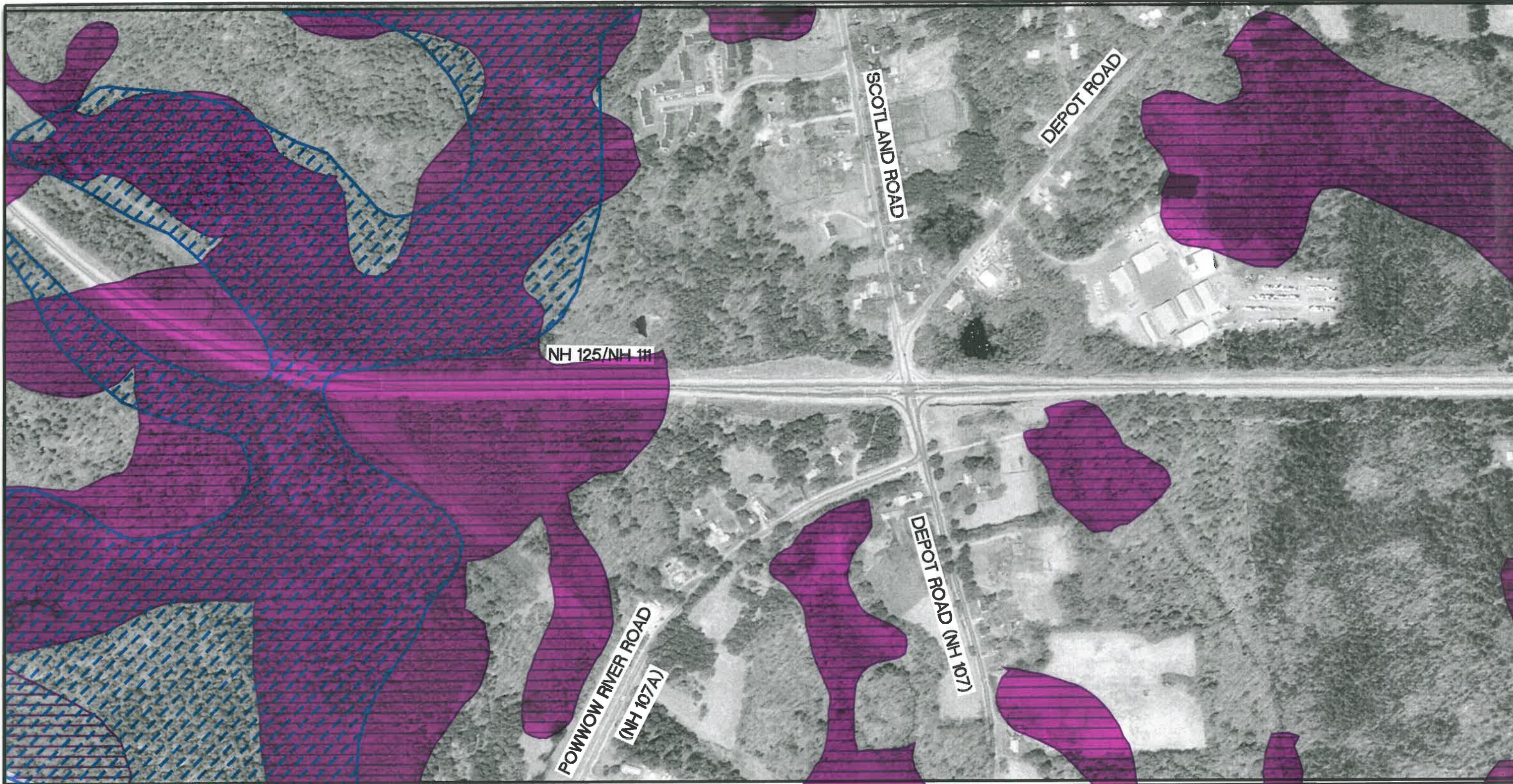
Vanasse Hangen Brustlin, Inc.

Figure 21

Constraint Maps

NH 125 Plaistow/Kingston
Feasibility Study





**1996 BASE TRAFFIC VOLUMES
(NH 125 SOUTH OF DEPOT ROAD)**

AM PEAK HOUR 930 vph
 PM 30TH HIGH HOUR 1,195 vph
 ADT 13,900 vpd

LEGEND:

- WETLAND
- VERY LOW SOIL POTENTIAL
- 100-YR FLOODPLAIN



Vanasse Hangen Brustlin, Inc.





**Figure 21
Constraint Maps**

**NH 125 Plaistow/Kingston
Feasibility Study**



**1996 BASE TRAFFIC VOLUMES
(NH 125 NORTH OF MAIN STREET)**

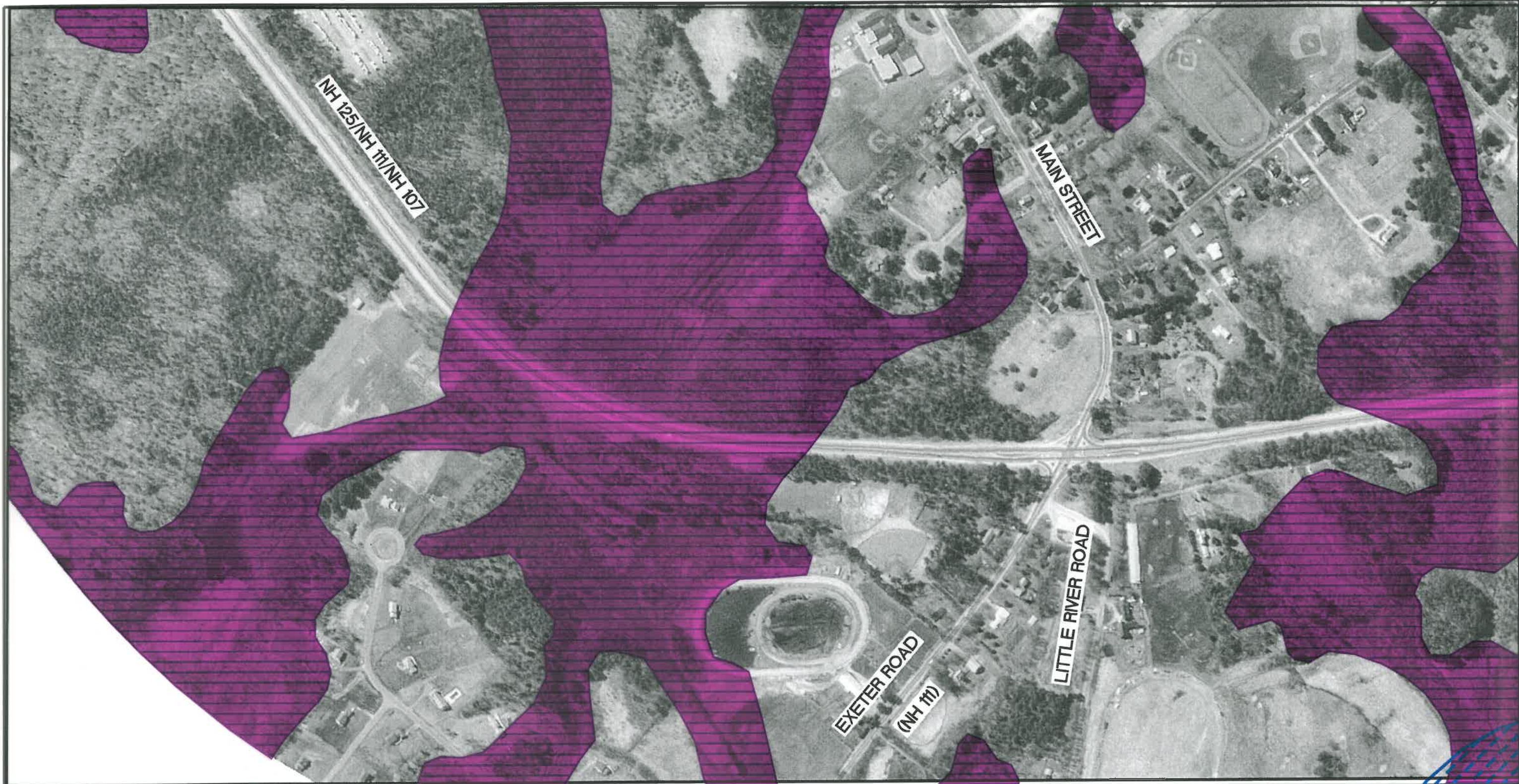
AM PEAK HOUR 945 vph
PM 30TH HIGH HOUR 1,160 vph
ADT 13,800 vpd

-  POTENTIAL DEVELOPABLE LAND
-  DEVELOPED LAND
-  CONSERVATION LAND
-  ZONING BOUNDARY

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Figure 22
Constraint Maps




NH 125 Plaistow/Kingston
Feasibility Study



**1996 BASE TRAFFIC VOLUMES
(NH 125 NORTH OF MAIN STREET)**

AM PEAK HOUR 945 vph
PM 30TH HIGH HOUR 1,160 vph
ADT 13,800 vpd

LEGEND:

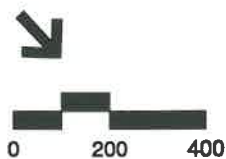
-  WETLAND
-  VERY LOW SOIL POTENTIAL
-  100-YR FLOODPLAIN

Vanasse Hangen Brustlin, Inc.

Figure 22

Constraint Maps

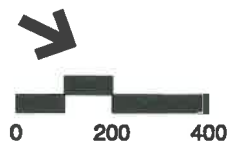
NH 125 Plaistow/Kingston
Feasibility Study









**1996 BASE TRAFFIC VOLUMES
(NH 125 SOUTH OF MARSHALL ROAD)**

AM PEAK HOUR 945 vph
PM 30TH HIGH HOUR 1,160 vph
ADT 13,800 vpd



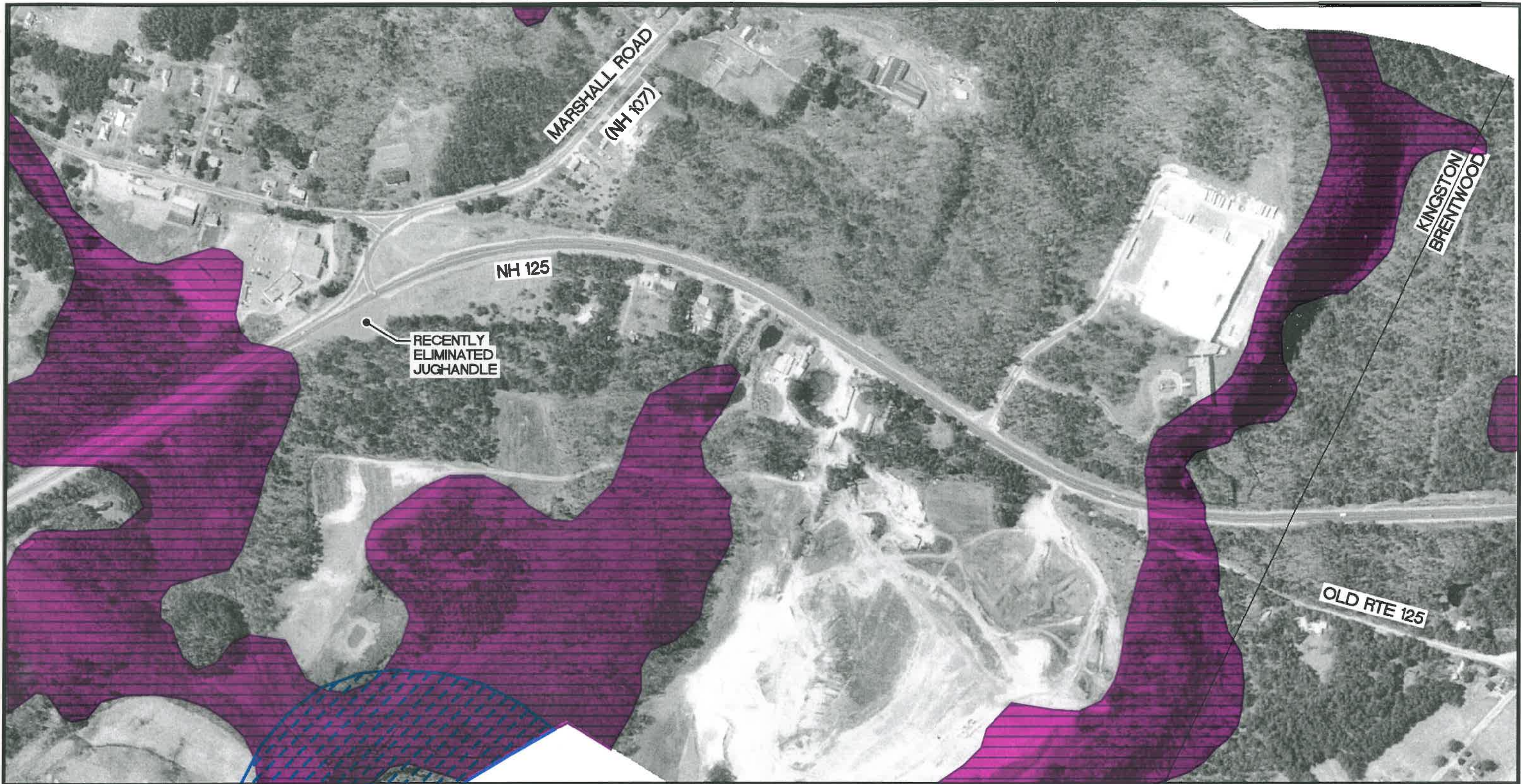
-  POTENTIAL DEVELOPABLE LAND
-  DEVELOPED LAND
-  CONSERVATION LAND
-  ZONING BOUNDARY

Vanasse Hangen Brustlin, Inc.

Figure 23

Constraint Maps

NH 125 Plaistow/Kingston
Feasibility Study

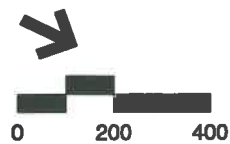


1996 BASE TRAFFIC VOLUMES
(NH 125 SOUTH OF MARSHALL ROAD)

AM PEAK HOUR	945 vph
PM 30TH HIGH HOUR	1,160 vph
ADT	13,800 vpd

LEGEND:

- WETLAND
- VERY LOW SOIL POTENTIAL
- 100-YR FLOODPLAIN



Vanasse Hangen Brustlin, Inc.

Figure 23

Constraint Maps

NH 125 Plaistow/Kingston
Feasibility Study

Traffic Volume Projections

To estimate future traffic volume growth, both historical growth trends and future land use potential were considered. In addition, growth rates developed through the Rockingham Planning Commission’s current traffic model were reviewed for the purpose of providing a reality check.

To estimate future land use potential along the corridor, the following methodology was used.

- A corridor bandwidth of 1,000 feet (500’ each side of the centerline of the roadway) was defined from which the amount of developable acreage was determined. With the exception of parcels that have access to secondary roads, the developable land does not include parcels that front the limited access portion of NH 125.
- In addition to the area within the corridor bandwidth, developable land was calculated within a 1,000-foot radius of each of eleven major intersections along the corridor.
- Potential future industrial sites located beyond the corridor bandwidth (4 sites) were identified and again the amount of developable land was determined.

The potential developable land was calculated by subtracting the amount of existing developed land and all constrained land from the total acreage within the defined area. Constraints to future development included soils with very low development potential ratings, water/wetlands, and conservation land. The land development analysis for the corridor, exclusive of the four industrial sites, is summarized in Table 7.

Table 7
Corridor Land Development Analysis

	Total Acreage	Existing Developed Acreage	Constrained Acreage	Remaining Developable Acreage
Kingston	900	450	100	350
Plaistow	<u>430</u>	<u>270</u>	<u>60</u>	<u>100</u>
Corridor Total	1,330	720	160	450

As shown in the table, the defined corridor bandwidth contains approximately 1,330 total acres. Of the total, approximately 720 acres (54 percent) is currently developed, 160 acres (12 percent) is constrained and will not likely be developed, and the remaining 450 acres (34

percent) is developable. Not surprisingly, approximately 350 acres (78 percent) of the 450 developable acres are located in Kingston.

To estimate the vehicle trip generating potential of the developable land located along the corridor as well as at the four potential industrial sites off the corridor, standardized Institute of Transportation Engineers (ITE) trip generation formulas were applied to three broad land use categories (residential, commercial/retail, and commercial/industrial) based on existing zoning. Additionally, adjustments factors that included a 25 percent reduction in trips for all uses to account for multi-purpose trips and a 50 percent reduction for commercial/retail to account for pass-by type trips were applied.

The weekday evening peak hour trip generation estimates for the area along the corridor and for the four industrial sites are summarized in Table 8. As shown in the table, the identified developable land could generate over 4,100 vehicle trips during the weekday evening peak hour.

Table 8
Trip Generation Summary
Evening Peak Hour

	Corridor Band Width	Industrial Sites	Total
Enter	1,625	136	1,761
Exit	<u>1,371</u>	<u>991</u>	<u>2,362</u>
Total	2,996	1,127	4,123

The vehicle trips generated by the developable land along the corridor and at the four industrial sites were distributed throughout the corridor. In addition, a 0.5 percent annual compounded growth rate was applied to account for regional non-corridor related growth.

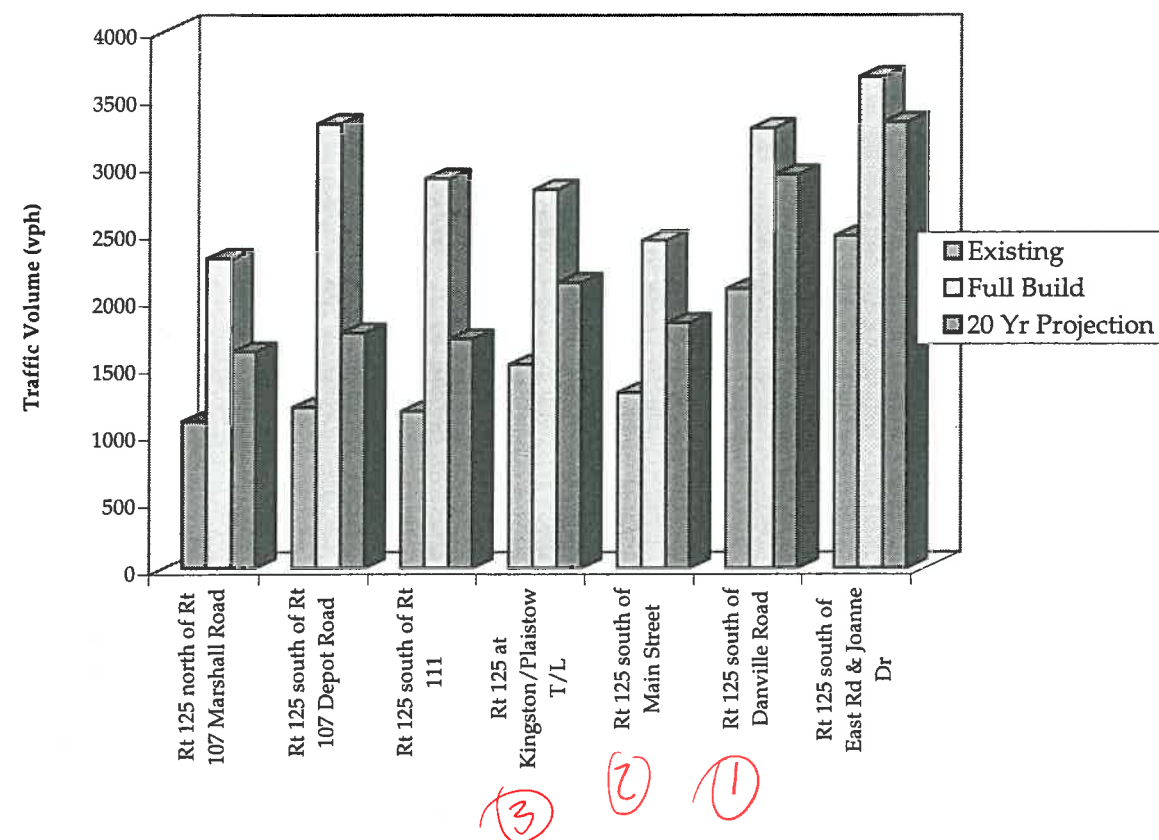
If the full build-out of the corridor as well as the industrial sites were to occur over a 20-year period, the average annual traffic growth rates would range as high as 5.2 percent per year with the higher growth occurring along the northern and central segments of the corridor and a lower growth rate of approximately 2 percent expected along the already built-up southern segment of the corridor. However, given that historical growth trends have generally run at approximately 2 percent per year, it is reasonable to conclude that the full build-out of the corridor will not occur within the next 20 years. In fact, if the full build-out were to occur within a 20 year period, the growth rate would significantly exceed the 1 to 2 percent annual growth rate projected for the corridor by the Rockingham Planning Commission’s current traffic model.

To reflect a more realistic growth rate, the full build-out projections were adjusted while maintaining the relative distributions of growth throughout the corridor. The adjustment

resulted in average annual growth rates ranging from 1.5 percent along the southern segment, to 1.75 percent along the central segment, and 2 percent along the northern segment.

The weekday evening peak hour traffic volumes for the existing, full build-out and 20-year conditions are shown for different segments of the corridor in Figure 24.

FIGURE 24
NH 125 PM PEAK HOUR TRAFFIC VOLUMES
EXISTING AND PROJECTED



The bar chart depicts the weekday evening peak hour traffic volume for various segments of NH 125. For each segment, the three columns reflect the existing traffic volumes, the full build-out traffic volumes and the projected 20-year design traffic volumes. For the purpose of this study, the 20-year design volumes will serve as the basis for the long-term improvement plan.

It is important to note that from an operational standpoint, the decision to expand from a two-lane roadway (one lane in each direction) to a four-lane roadway (two lanes in each direction) generally occurs when the design hour volume reaches the 1,700 to 1,800 vph

range. As shown in the chart, this level is exceeded under existing conditions only along the southern segment of the corridor (from Danville Road to Joanna Drive).

Under the 20-year traffic volume projections this level extends northward throughout all of Plaistow and into Kingston to approximately the Hunt Road and Newton Junction Road intersection. As a result, the long-term plan for the corridor will need to consider a four-lane cross-section south of the Hunt Road and Newton Junction Road intersection while the segment of NH 125 north of this area should be able to maintain a two-lane cross-section. In general, the two lane and four lane sections are used for segments of roadway where turning movements are minimal. Where side street or driveway turning movements occur more frequently, three lane (one through lane in each direction and a center turn lane) and five lane (two through lanes in each direction and a center turn lane) sections are used.

The 2016 weekday AM and PM traffic volume networks are shown in Figure 25.

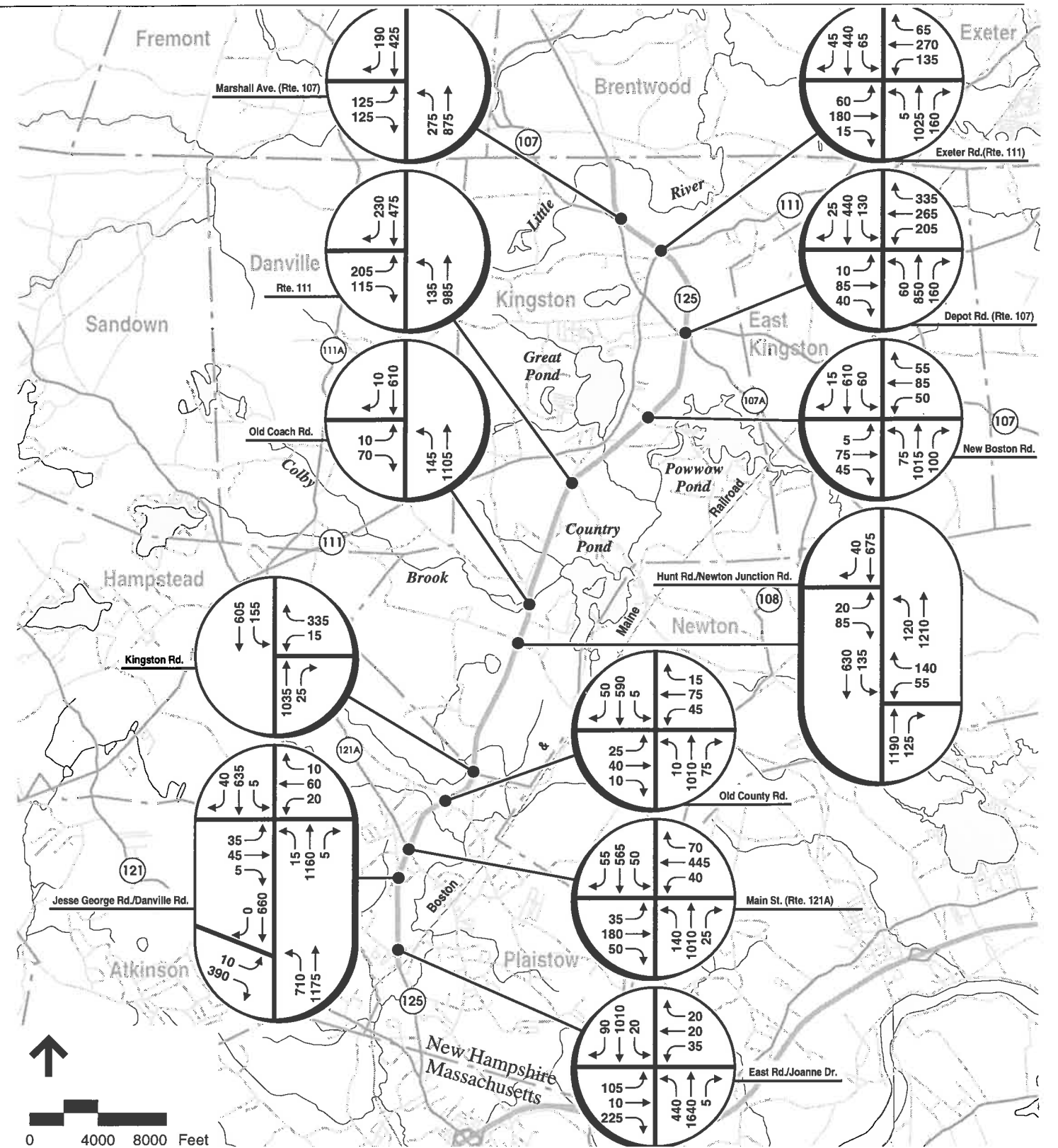
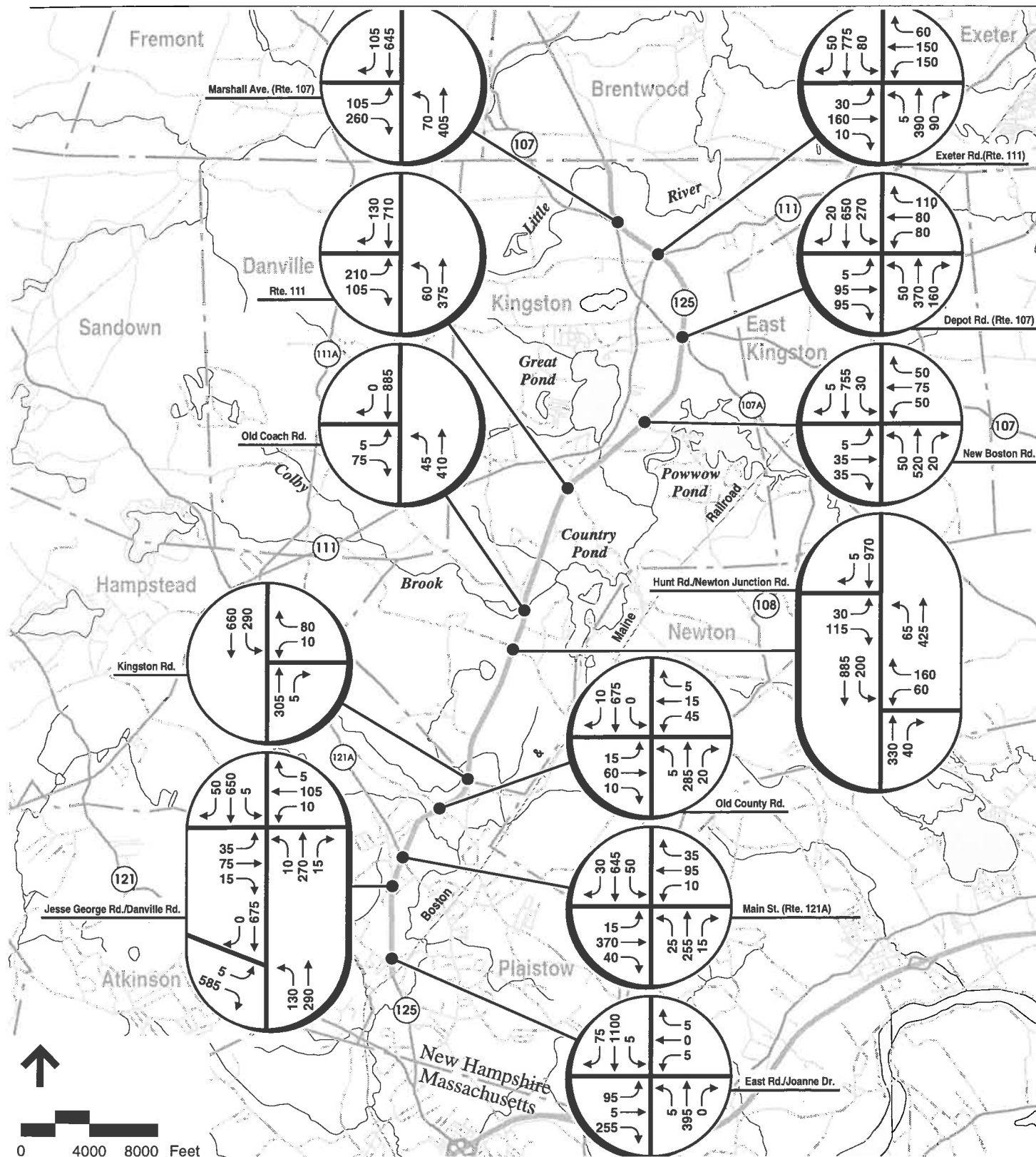
Future Traffic Operations

A level of service analysis, similar to the existing condition analysis was conducted at the key study area intersections and roadway segments for the project year 2016 traffic volume condition. The analysis reflects the 20-year traffic volume demands on the exiting roadway network.

The results of the signalized intersection analyses revealed acceptable levels of service (LOS C or better) at the Route 111 By-Pass intersection and at the East Road/Joanne Drive intersection. The Depot Road (Route 107) intersection deteriorates to a LOS D with a volume capacity ratio (v/c) of 0.99 during the evening peak hour. Both the Exeter Road (Route 111) and Main Street (Route 121A) intersections deteriorate to LOS F.

The results of the unsignalized intersection analysis continue to show that the left-turn exiting movements from nearly all of the corridor side streets operate at poor levels of service (LOS E or F). An evaluation of the roadway segments along NH 125 for the 20-year condition show all segments operating at LOS E with the southernmost segment from Danville Road to East Road operating at LOS F.

The results of the signalized intersection, unsignalized intersection, and roadway link analyses are summarized in Table 9, 10, and 11.



Vanasse Hangen Brustlin, Inc.

Weekday Morning Peak Hour

Weekday Evening Peak Hour

Figure 25
2016 Design Hour Volumes

NH 125 Plaistow/Kingston
Feasibility Study

Table 9
Signalized Intersection Analysis
2016 Future Condition

Intersection	Analysis Period	V/C	Delay	LOS
KINGSTON				
NH 125 at Route 111 (Exeter Road)	AM	0.93	25	C
	PM	> 1.2	++	F
NH 125 at Route 107 (Depot Road)	AM	0.70	14	B
	PM	0.99	36	D
NH 125 at Route 111 (New Connection)	AM	0.80	14	B
	PM	0.95	17	C
PLAISTOW				
NH 125 at North Main Street	AM	0.95	26	D
	PM	> 1.2	++	F
NH 125 at East Road/Joanne Drive	AM	0.69	9	B
	PM	0.92	24	C

++ Delay is meaningless when v/c is greater than 1.2

v/c – Volume to capacity ratio

Delay – Average intersection delay expressed in seconds

LOS – Level of service

Table 10
Unsignalized Intersection Analysis
2016 Future Condition

Intersection	Demand	AM Delay	LOS	Demand	PM Delay	LOS
KINGSTON						
<u>NH 125 at Rt. 107 (Marshall Rd)</u>						
Left from NH 125	70	6	B	275	7	B
Left from Rt. 107	105	83	F	125	888	F
Right From Rt. 107	260	13	C	125	6	B
<u>NH 125 at New Boston Road</u>						
Left from NH 125 NB	50	6	B	75	5	A
Left from NH 125 SB	30	4	A	60	9	B
Left/Thru/Right from New Boston Rd EB	75	40	E	125	+	F
Left/Thru/Right from New Boston Rd WB	175	430	F	190	+	F
<u>NH 125 at Old Coach Road</u>						
Left from NH 125	45	7	B	145	7	B
Left/Right from Old Coach Road	80	15	C	80	+	F
<u>NH 125 at Hunt Road</u>						
Left from NH 125	65	8	B	120	6	B
Left/Right from Hunt Road	145	50	F	105	756	F
<u>NH 125 at Newton Junction Road</u>						
Left from NH 125	200	4	A	135	24	D
Left/Right from Newton Junction Road	220	241	F	195	+	F
PLAISTOW						
<u>NH 125 at Kingston Road</u>						
Left from NH 125	290	4	A	155	10	C
Right from Kingston Road	80	4	A	335	62	F
Left from Kingston Road Ext.	10	15	C	15	41	E
<u>NH 125 at Old County Road</u>						
Left from NH 125 NB	5	5	A	10	6	B
Left from NH 125 SB	5	3	A	5	7	B
Left/Thru/Right from Old County Road EB	85	19	C	73	548	F
Left/Thru/Right from Old County Road WB	65	29	D	135	538	F
<u>NH 125 at Jesse George Road</u>						
Left from NH 125 NB	10	6	B	15	6	B
Left from NH 125 SB	5	3	A	5	8	B
Left/Thru/Right from Jesse George Road EB	125	139	F	85	+	F
Left/Thru/Right from Jesse George Road WB	120	44	E	90	538	F
<u>NH 125 at Danville Road</u>						
Right from Danville Road	590	81	F	400	35	E
<u>NH 125 at Danville Road Ext.</u>						
Left/Thru from Danville Road Ext.	130	12	C	710	339	F

+ Delay is greater than 999.9 sec.

Table 11
Roadway Link Analysis
2016 Future Condition

Roadway Segment	Analysis Period	Flow Rate	Service Flow Rate	V/C	LOS
<u>KINGSTON</u>					
NH 125 between Depot Rd and New Boston Rd	AM	1,517	2,423	0.63	E
	PM	1,950	2,470	0.79	E
NH 125 between Rt. 111 and Old Coach Rd	AM	1,389	2,288	0.61	E
	PM	1,900	2,463	0.77	E
NH 125 between Newton Junction Road and Plaistow T/L	AM	1,461	2,319	0.63	E
	PM	2,222	2,474	0.90	E
<u>PLAISTOW</u>					
NH 125 between Kingston T/L and Kingston Road	AM	1,483	2,250	0.66	E
	PM	2,367	2,453	0.96	E
NH 125 between North Main St and Jesse George Rd	AM	1,100	2,167	0.51	D
	PM	2,033	2,501	0.81	E
NH 125 between Danville Rd and East Rd/Joanne Drive	AM	1,861	2,329	0.80	E
	PM	3,206	2,567	1.25	F

4
3
2
6

Long Range Plan

The previous sections of this report identify a number of existing and anticipated future study corridor capacity and safety related deficiencies. One way to address the identified deficiencies is to upgrade each of the key study area intersections and widen NH 125 to provide additional travel lanes. However, based on input received through a series of public informational meetings and through members of the Technical Advisory Committee, it is clear that although the communities of Kingston and Plaistow recognize the need to process traffic along the corridor and to provide additional roadway capacity, their primary objective is to manage traffic more effectively so that perhaps the number of additional lanes needed can be minimized. One way of more effectively managing the flow of traffic along the corridor is through the establishment and implementation of an access management plan. It is for this reason that the long-range plan incorporates an access management plan. The conceptual roadway improvement plan and the access management plan are described in the following sections.

Conflicting objective!

Conceptual Roadway Plans

The long-range improvement plan attempts to balance the need to accommodate expected traffic growth and enhance safety through the better management of the traffic. The successful implementation of an access management plan will enhance the throughput capacity of the corridor and will as a result reduce the amount of roadway widening (additional travel lanes) along particular segments of the corridor that would otherwise be needed.

In general, the objective of the long-range plan is, with the exception of at the primary signalized intersections, to maintain the existing 2-lane cross-section for much of the northern and central segments of the corridor, namely north of Hunt Road. The plan concentrates turning movements, particularly left-turn movements, at the primary signalized intersections. At each of these intersections, NH 125 would, for the most part, be widened to a five-lane cross-section consisting of two through lanes and an exclusive left-turn lane in each direction with the directional flow separated by a raised median. The recommended cross-section along the southern segment of the corridor (south of Hunt Road) will include two through lanes in each direction plus sufficient width to accommodate a left-turn lane at the major intersections, a two-way left-turn lane between the major intersections, or perhaps a raised or painted median along particular segments of the corridor. For the purpose of this study, the recommended plan calls for raised medians only in the immediate vicinity of the major intersections.

It should be noted that the recommended cross-section provides for bicycle travel along the paved shoulders. A regional bicycle route network, which includes the "study" portion of NH 125, is identified in the currently adopted MPO Transportation Plan for the region and on the statewide bicycle network. When the regional bicycle network is ready for implementation, (i.e., when routes or sub-routes are complete with connections between centers of activity and other desirable origins and destinations), the shoulder area along NH 125 should be striped, signed, and maintained as bicycle lanes.

The long-range plan calls for the development of connector roadways aimed at reducing the number of uncontrolled left-turn movements by providing access to the primary signalized intersections. In addition to the upgrade of the primary intersections, the long-range plan also calls for the realignment or closure of many of the minor side street intersections that currently intersect NH 125 at skewed angles.

It is important to recognize that the conceptual roadway improvement plans are not designed to the point where the extent of environmental impacts or land takings can be identified. However, the plans do show the type and location of improvements that will be necessary to accommodate anticipated traffic growth over the next 20 years.

The conceptual roadway improvement plans are depicted graphically in Figures 26 through 35. A brief description of the proposed improvements at each of the major intersections is provided below.

Main Street/Jesse George Road/Danville Road

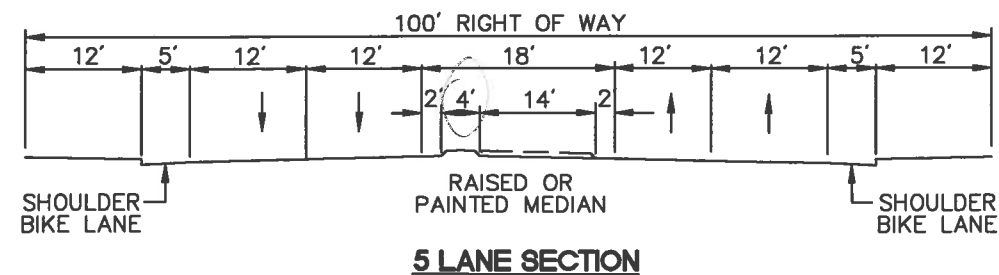
The NH 125/Main Street intersection in Plaistow will, under the future condition, need to be upgraded to include the widening of NH 125 to at least a five-lane section, consisting of two through lanes and an exclusive left-turn lane in each direction. The Main Street eastbound and westbound approaches to the intersection would consist of an exclusive left-turn lane and a single shared through/right-turn lane. The Main Street approaches would not require any additional widening beyond that which was recommended under the interim plan. However, given the proximity of the Jesse George Road and Danville Road intersections, any recommendation at the Main Street intersection must consider the traffic operations at all three intersections.

Clearly the existing configuration at the NH 125/Danville Road intersection will not accommodate the projected future traffic volume demands. A number of alternatives have been considered including: realigning Danville Road so as to intersect NH 125 at a



2016 FUTURE TRAFFIC VOLUMES
(NH 125 NORTH OF EAST STREET)

AM PEAK HOUR 1,675 vph
PM 30TH HIGH HOUR 2,885 vph



LEGEND:

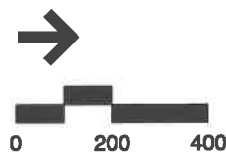
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-  PROPOSED SIGNAL

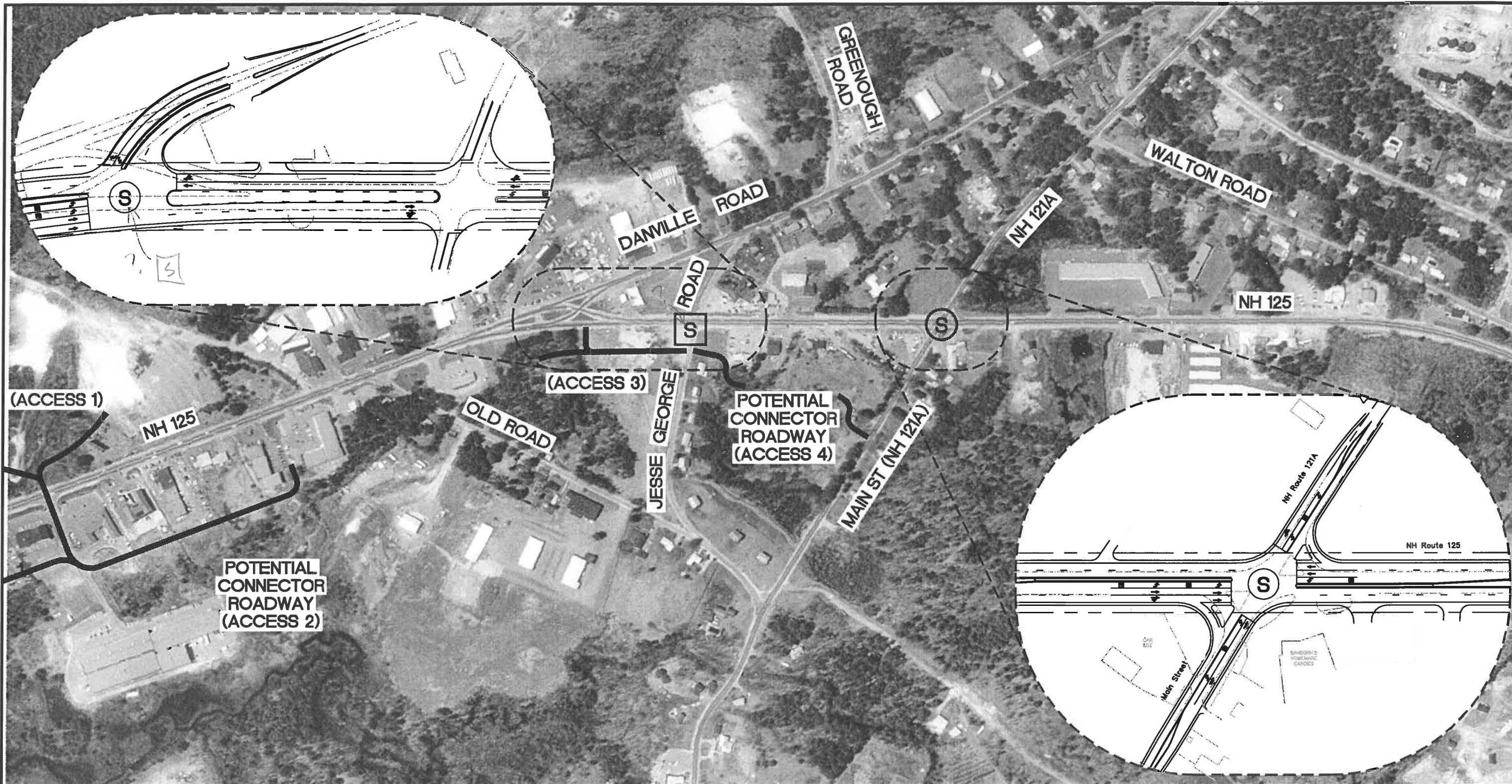
Vanasse Hangen Brustlin, Inc.

Figure 26

Long-Range Improvements

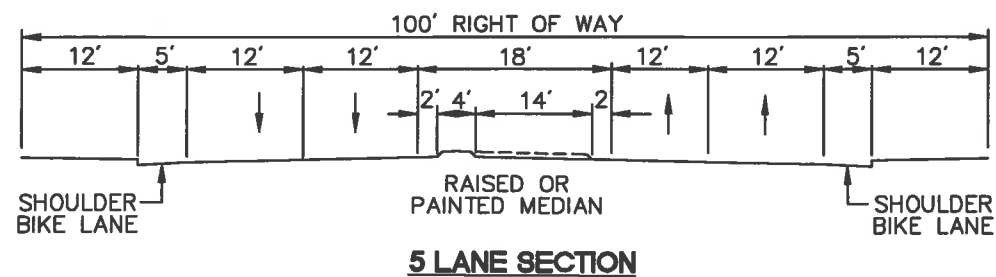
NH 125 Plaistow/Kingston
Feasibility Study





**2016 FUTURE TRAFFIC VOLUMES
(NH 125 NORTH OF JESSE GEORGE ROAD)**

AM PEAK HOUR 1,015 vph
PM 30TH HIGH HOUR 1,885 vph



LEGEND:

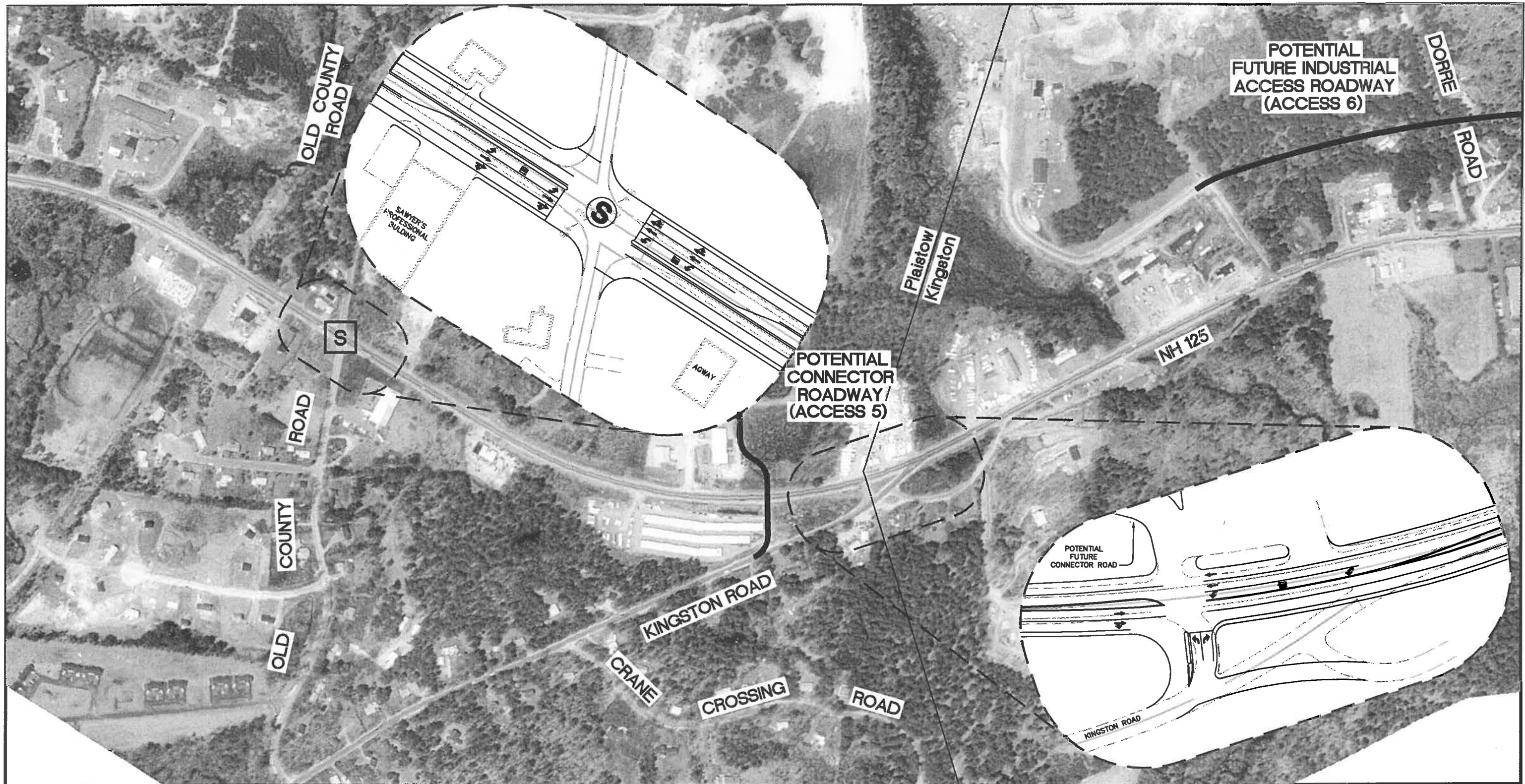
- S EXISTING SIGNAL
- S PROPOSED SIGNAL

Vanasse Hangen Brustlin, Inc.

Figure 27
Long-Range Improvements

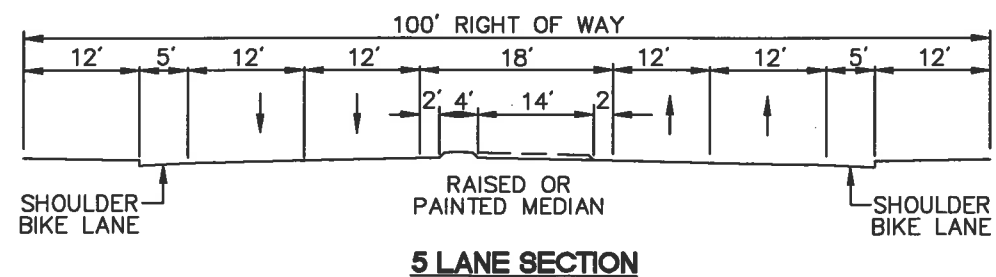
NH 125 Plaistow/Kingston
Feasibility Study





2016 FUTURE TRAFFIC VOLUMES
(NH 125 NORTH OF OLD COUNTY ROAD)

AM PEAK HOUR 990 vph
PM 30TH HIGH HOUR 1,695 vph



LEGEND:

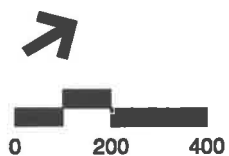
- S EXISTING SIGNAL
- S PROPOSED SIGNAL

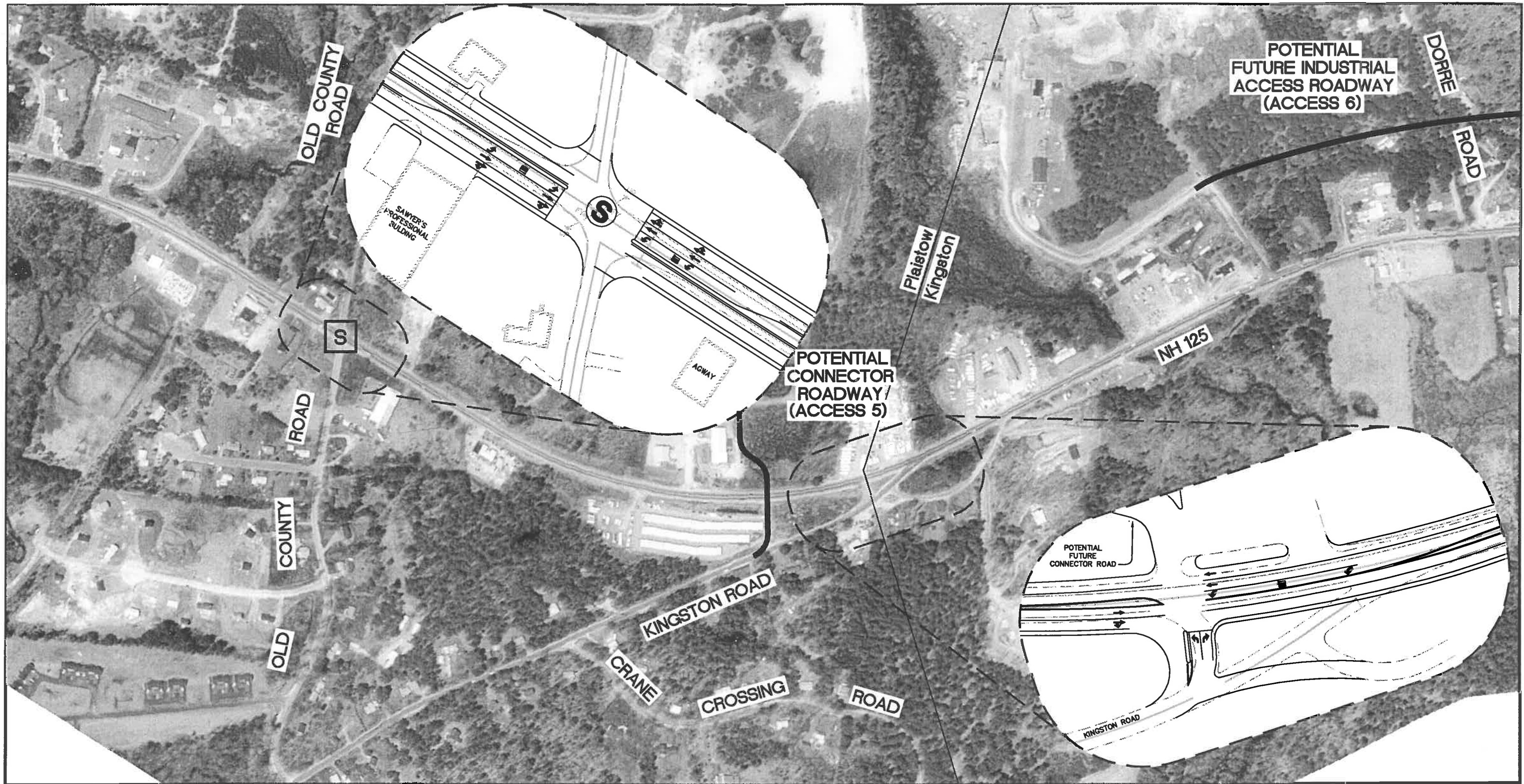
Vanasse Hangen Brustlin, Inc.

Figure 28

Long-Range Improvements

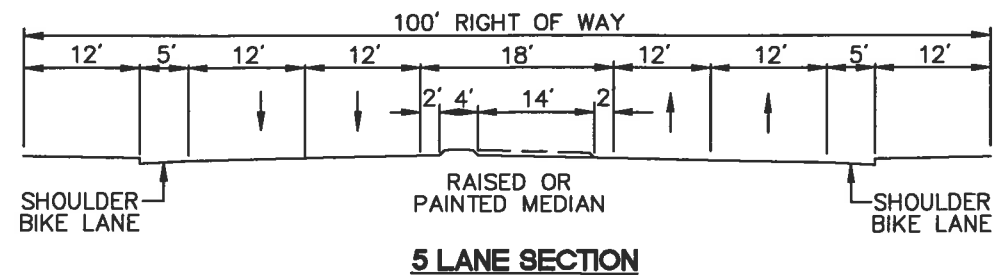
NH 125 Plaistow/Kignston
Feasibility Study





**2016 FUTURE TRAFFIC VOLUMES
(NH 125 NORTH OF OLD COUNTY ROAD)**

AM PEAK HOUR 990 vph
PM 30TH HIGH HOUR 1,695 vph



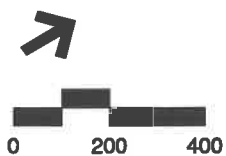
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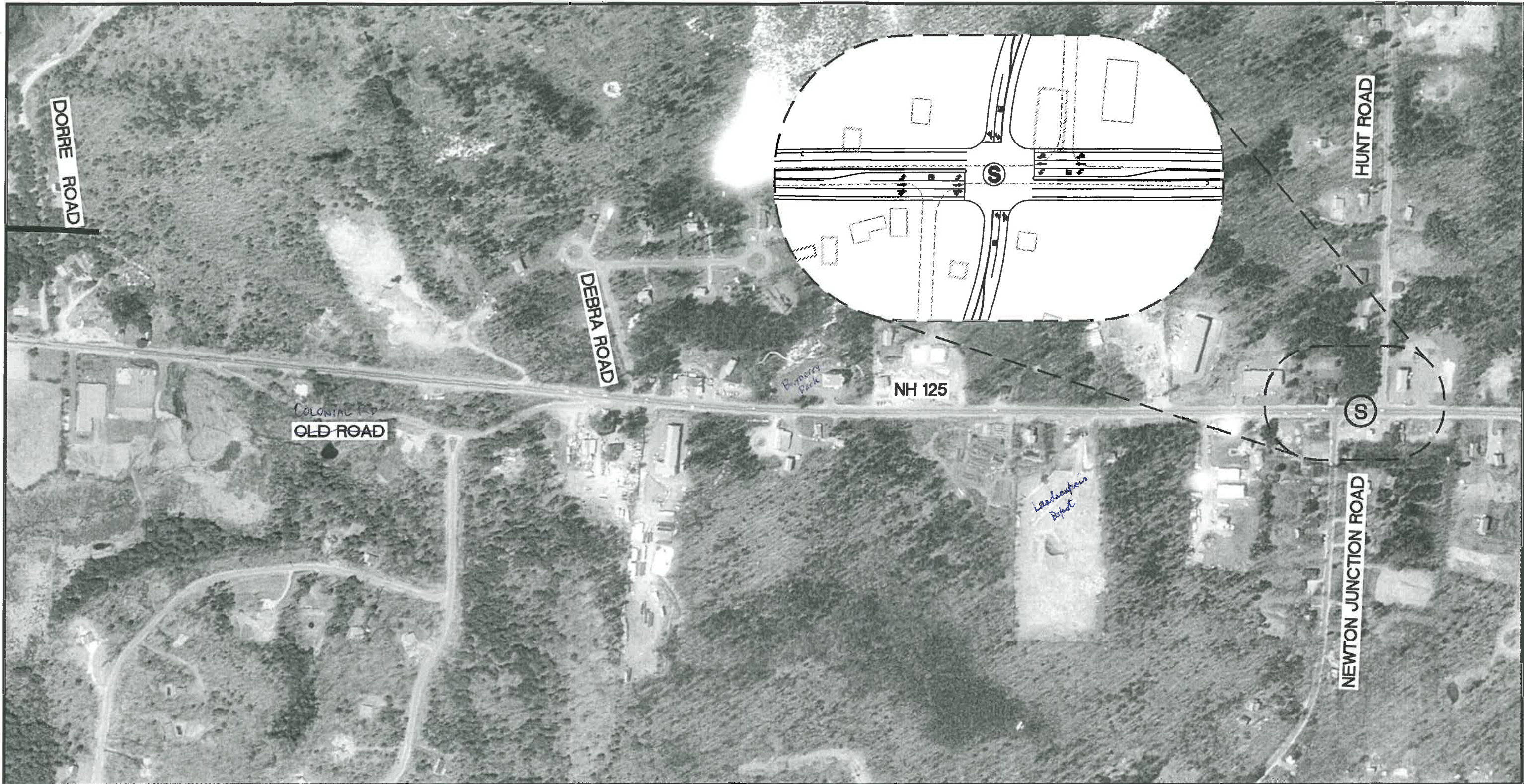
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-  PROPOSED SIGNAL

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Figure 28
Long-Range Improvements

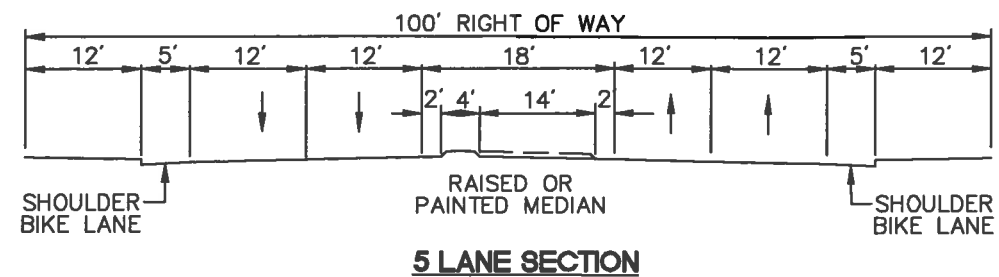
NH 125 Plaistow/Kignston
Feasibility Study





2016 FUTURE TRAFFIC VOLUMES
(NH 125 SOUTH OF NEWTON JCT. ROAD)

AM PEAK HOUR 1,315 vph
PM 30TH HIGH HOUR 2,000 vph



LEGEND:

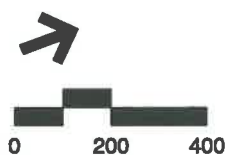
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- [S] PROPOSED SIGNAL

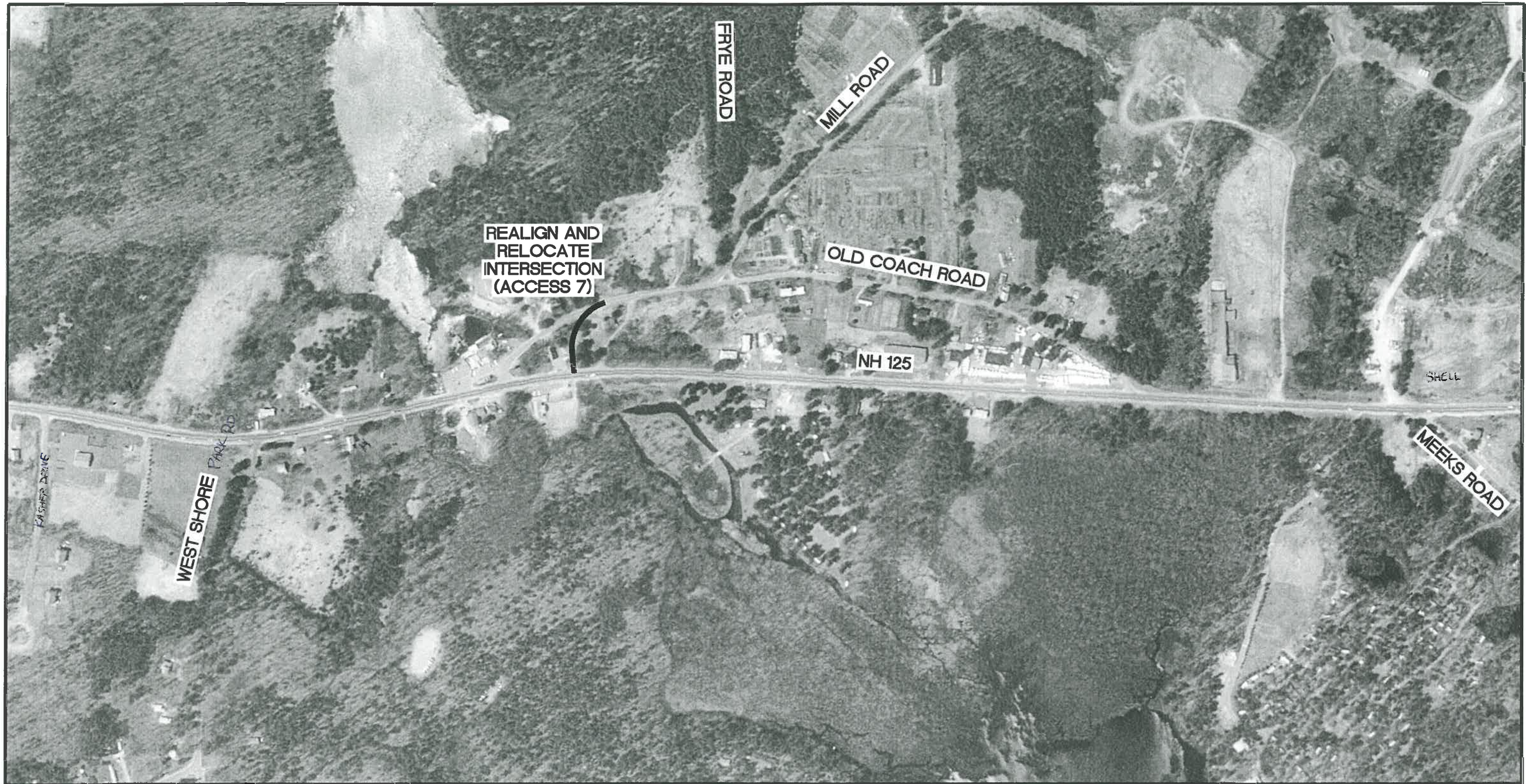
Vanasse Hangen Brustlin, Inc.

Figure 29

Long-Range Improvements

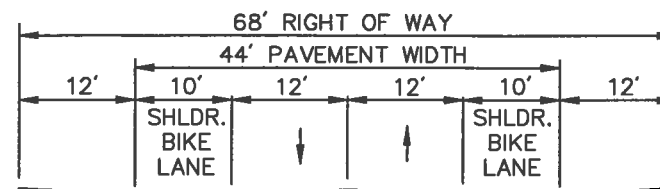
NH 125 Plaistow/Kingston
Feasibility Study





**2016 FUTURE TRAFFIC VOLUMES
(NH 125 NORTH OF OLD COACH ROAD)**

AM PEAK HOUR 1,300 vph
PM 30TH HIGH HOUR 1,735 vph



2 LANE SECTION

LEGEND:

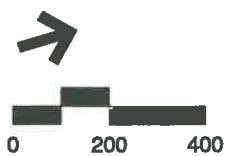
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-  PROPOSED SIGNAL

Vanasse Hangen Brustlin, Inc.

Figure 30

Long-Range Improvements

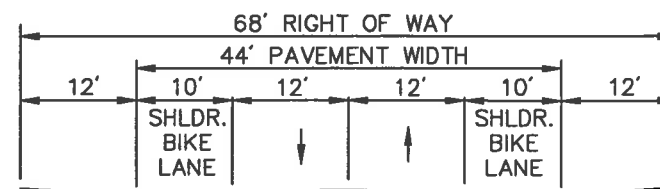
NH 125 Plaistow/Kingston
Feasibility Study





2016 FUTURE TRAFFIC VOLUMES
(NH 125 SOUTH OF RTE. 111 BY-PASS)

AM PEAK HOUR 1,250 vph
PM 30TH HIGH HOUR 1,710 vph



2 LANE SECTION

LEGEND:

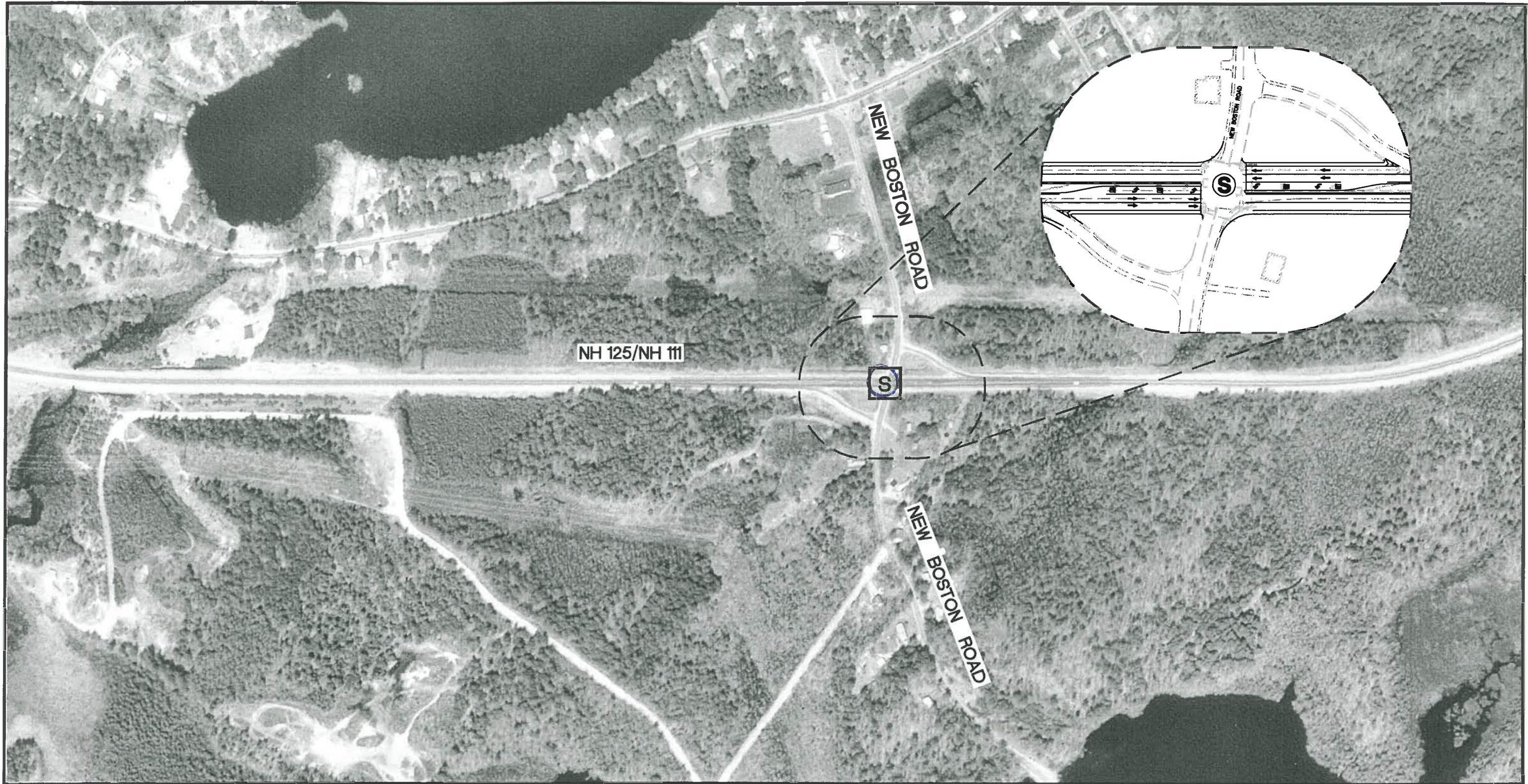
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-  PROPOSED SIGNAL

Vanasse Hangen Brustlin, Inc.

Figure 31

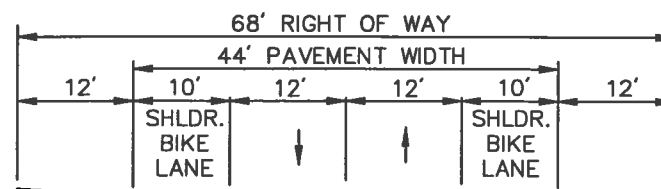
Long-Range Improvements

NH 125 Plaistow/Kingston
Feasibility Study



**2016 FUTURE TRAFFIC VOLUMES
(NH 125 SOUTH OF NEW BOSTON ROAD)**

AM PEAK HOUR 1,430 vph
PM 30TH HIGH HOUR 1,895 vph



2 LANE SECTION

LEGEND:

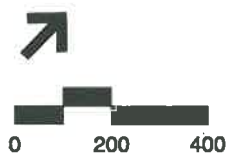
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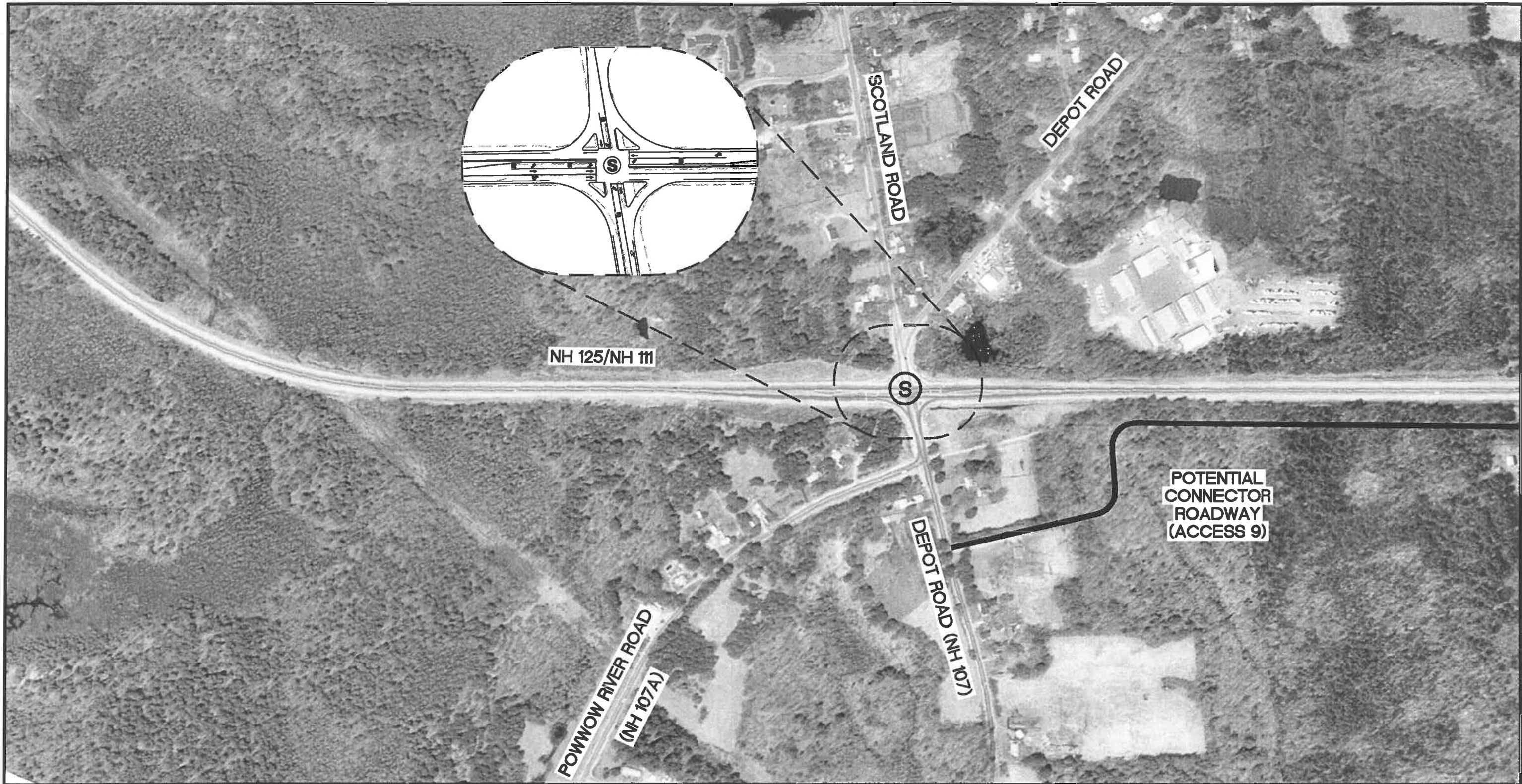
Vanasse Hangen Brustlin, Inc.

Figure 32

Long-Range Improvements

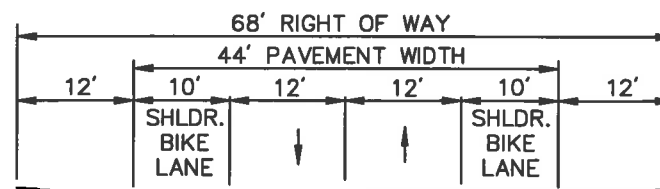
**NH 125 Plaistow/Kingston
Feasibility Study**





2016 FUTURE TRAFFIC VOLUMES
(NH 125 SOUTH OF DEPOT ROAD)

AM PEAK HOUR 1,405 vph
PM 30TH HIGH HOUR 1,755 vph



2 LANE SECTION

LEGEND:

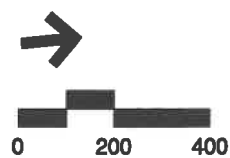
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- PROPOSED SIGNAL

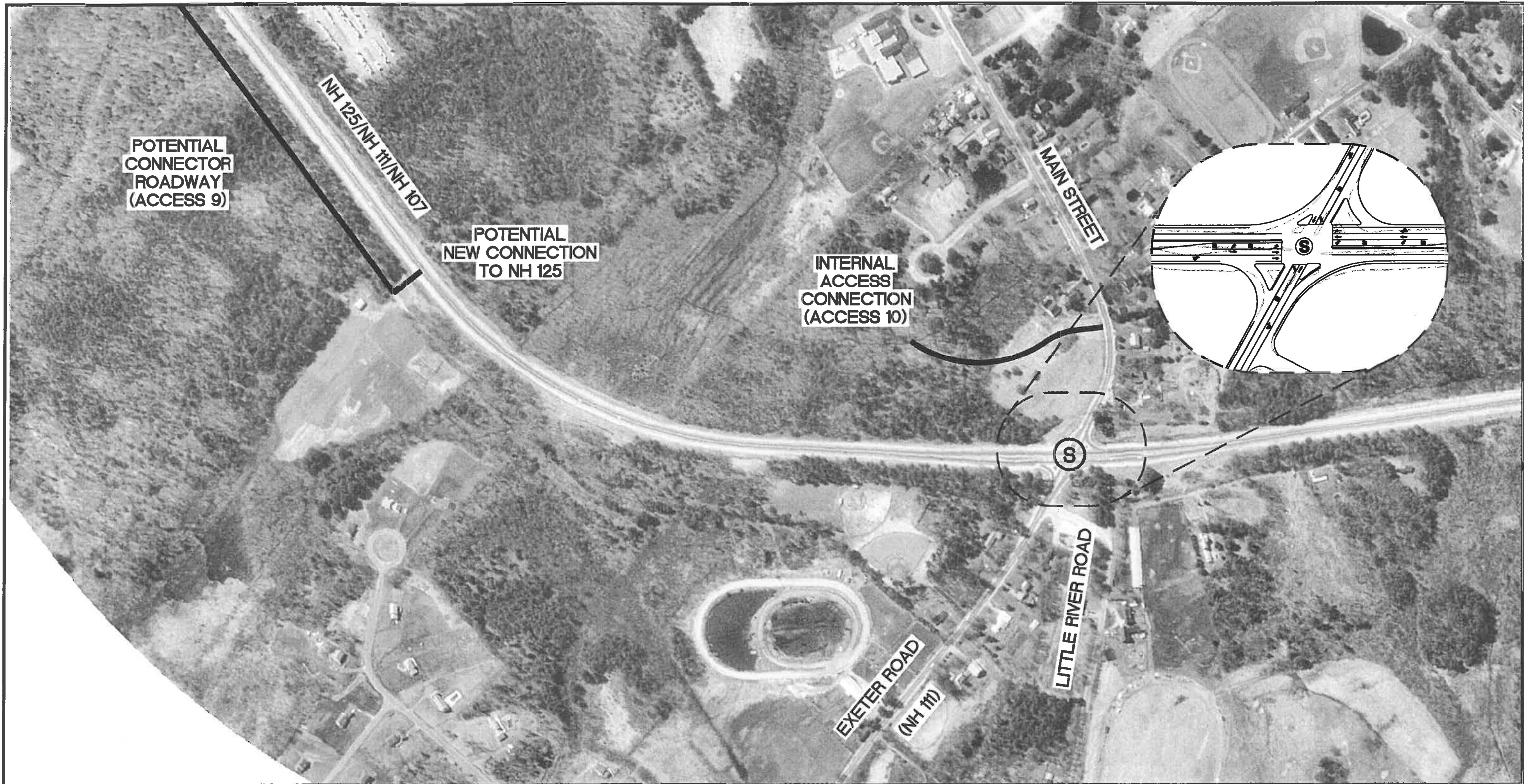
Vanasse Hangen Brustlin, Inc.

Figure 33

Long-Range Improvements

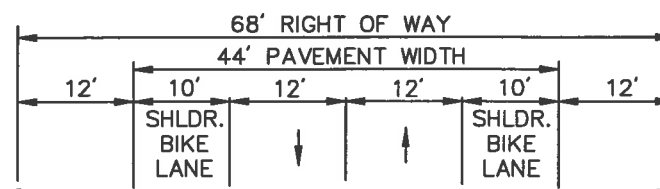
NH 125 Plaistow/Kingston
Feasibility Study





**2016 FUTURE TRAFFIC VOLUMES
(NH 125 NORTH OF MAIN STREET)**

AM PEAK HOUR 1,385 vph
PM 30TH HIGH HOUR 1,700 vph



2 LANE SECTION

LEGEND:

-  EXISTING SIGNAL
-  PROPOSED SIGNAL

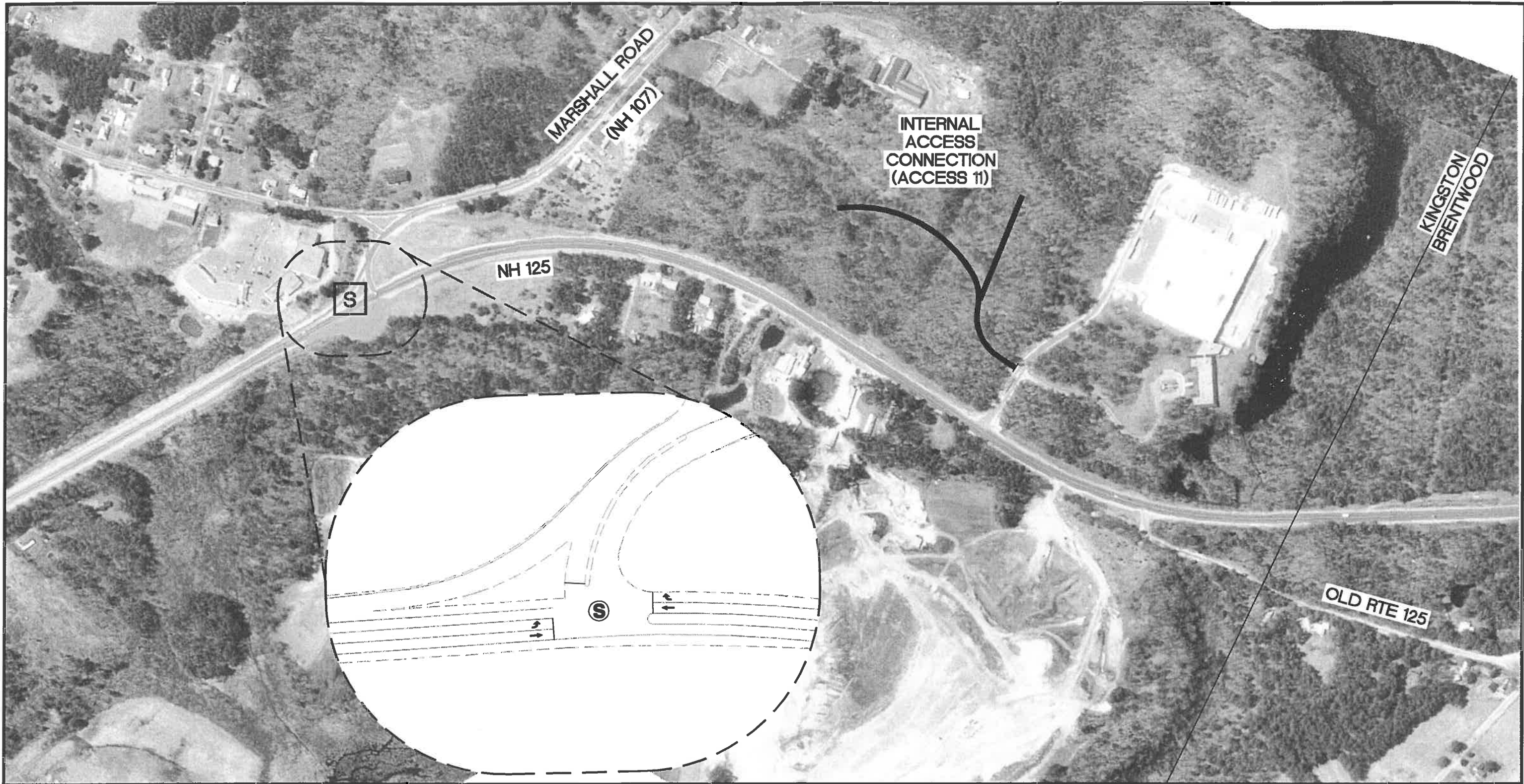
Vanasse Hangen Brustlin, Inc.

Figure 34

Long-Range Improvements

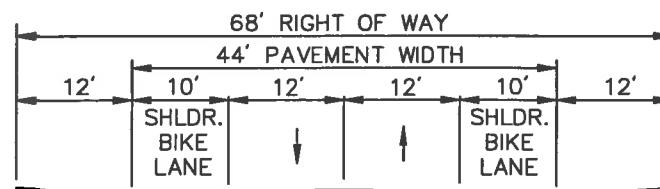
**NH 125 Plaistow/Kingston
Feasibility Study**





**2016 FUTURE TRAFFIC VOLUMES
(NH 125 SOUTH SIDE OF MARSHALL ROAD)**

AM PEAK HOUR 1,385 vph
PM 30TH HIGH HOUR 1,700 vph



2 LANE SECTION

LEGEND:

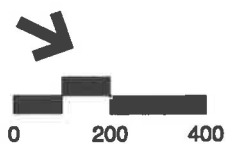
- S EXISTING SIGNAL
- S PROPOSED SIGNAL

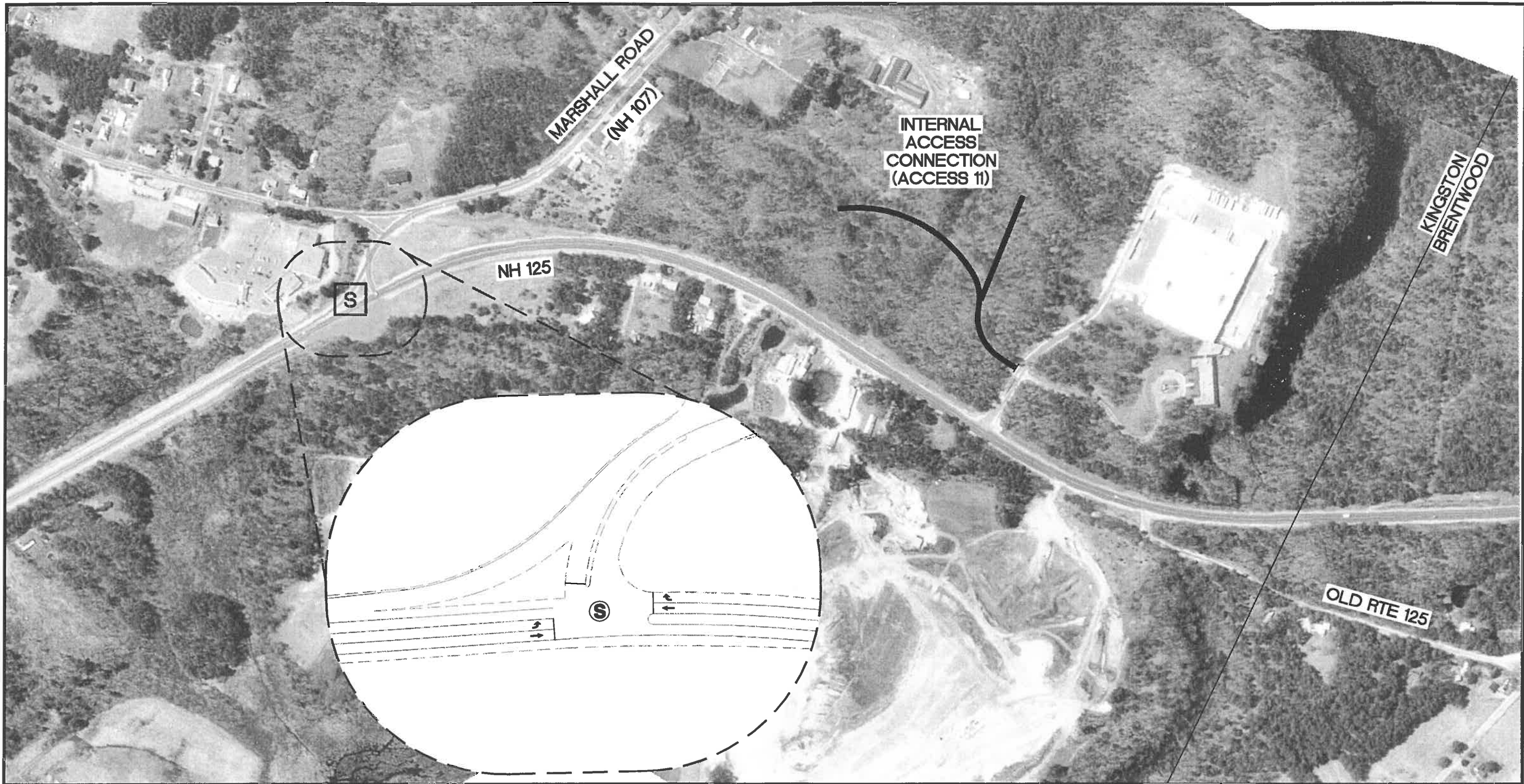
Vanasse Hangen Brustlin, Inc.

Figure 35

Long-Range Improvements

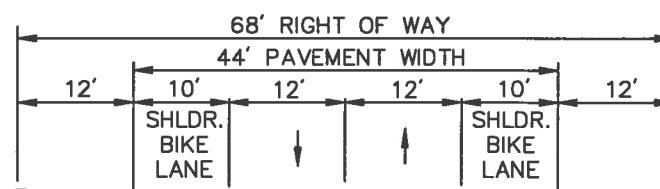
NH 125 Plaistow/Kingston
Feasibility Study





2016 FUTURE TRAFFIC VOLUMES
(NH 125 SOUTH SIDE OF MARSHALL ROAD)

AM PEAK HOUR 1,385 vph
PM 30TH HIGH HOUR 1,700 vph



2 LANE SECTION

LEGEND:

-  EXISTING SIGNAL
-  PROPOSED SIGNAL

Vanasse Hangen Brustlin, Inc.

Figure 35

Long-Range Improvements

NH 125 Plaistow/Kingston
Feasibility Study



“T-type” signalized intersection, or eliminating the Danville Road connection at NH 125 and providing access to and from Danville Road at a signalized intersection at Jesse George Road.

To evaluate the various alternatives, consideration was given to such factors as, the need to maintain access to the existing commercial establishments in the area, the potential impact to the residential homes in the area - particularly along Jesse George Road- and the long-term vision for the area. For example, should Danville Road continue to carry much of the through traffic that travels between NH 125 in the south and NH 121A in the west? Input received from the community was somewhat mixed with some preferring to try to divert much of the through traffic from Danville Road to Main Street, while others felt that it was important to, as best possible, evenly distribute traffic between the two alternative routes.

The NHDOT’s current plan to realign the Danville Road/NH 121A intersection for the purpose of eliminating the skewed angle that currently encourages traffic flow onto Danville Road with a T-type intersection is consistent with an effort to divert traffic to Main Street. However, there are other ways to manage the flow of traffic at the NH 125 intersections. Motorists can be encouraged or discouraged from using one route over another based on the available capacity of intersection. The primary determinates of capacity at a signalized intersection are the number of lanes and amount of green time available to a particular movement. In this case, given the projected travel demand of vehicles destined to the west from the south on NH 125, it is likely that a double left-turn lane will eventually be needed on the NH 125 northbound approach to the Danville Road intersection. However, if the goal is to divert through traffic from Danville Road to Main Street, it would perhaps be better to provide the double left-turn and additional green time at Main Street.

The community does have time to consider these traffic management options as any upgrade of the Danville Road intersection or the Main Street intersection could be constructed with a single turn lane initially, with one or the other eventually being widened to provide a double left-turn lane. For the purpose of this study, it is recommended that the long-term plan shows the double left-turn lane at Danville Road, with the understanding that the community may opt to reconsider this recommendation, once a clear objective is determined.

Therefore to accommodate the future traffic volume demands and to maintain access to the established commercial uses in the area, the long-range plan for this area consists of the following:

- Widen NH 125 at Main Street to consist of an exclusive left-turn lane, a single through lane, and a shared through/right-turn lane on the northbound and southbound approaches. Directional traffic at the intersection would be separated by a raised median. The intersection would operate, under the future 20-year condition at LOS B for the AM peak hour and LOS C for the PM peak hour.
- Realign and reconstruct Danville Road so that it intersects NH 125 at a “T-type” intersection. Widen NH 125 and install a traffic signal. Lane use along NH 125 at the intersection would consist of a double left-turn lane and two through lane on the northbound approach, and a through lane and a shared through/right-turn lane on the southbound approach. Lane use on Danville Road would consist of a left-turn lane and a

right-turn lane on the approach to the intersection, as well as two departure lanes that would taper to one to accommodate the double left-turn movement from NH 125. Directional flow at the intersection would be separated by a raised median. The intersection would operate, under the future 20-year condition, at LOS B for the AM and PM peak hours.

- Turn movements at the NH 125/Jesse George Road intersection would be restricted to right-turn in/right-turn out only.

Old County Road

The recommended long-range improvement plan for the NH 125/ Old County Road intersection is to install a traffic signal and to widen NH 125 to a five-lane section consisting of an exclusive left-turn lane, a single through lane, and a shared through/right-turn lane in each direction. Directional traffic at the intersection would be separated by a raised median. The intersection, with the proposed improvements in place, is projected to operate at LOS B under the year 2016 AM and PM peak hour conditions.

Kingston Road

The predominant turning movements at the NH 125/Kingston Road intersection are the northbound right-turn exiting movement from Kingston Road onto NH 125, and the NH 125 southbound left turn entering Kingston Road. Currently, there is little intersection delineation as these movements enter and exit Kingston Road at a skewed angle. The recommended interim plan is to improve the alignment of the intersection and to provide an exclusive southbound left-turn lane on NH 125, however the right-turn exiting movement would continue to operate as it does today. The long-range improvement plan for this intersection is to realign Kingston Road so that it intersects NH 125 at a standard T-type intersection with both the southbound left turns onto Kingston Road and the northbound right turns exiting Kingston Road at a 90 degree angle. Lane use on NH 125 at the intersection would consist of a single through lane, and a shared through/right-turn lane on the northbound approach, and an exclusive left-turn lane, a single through lane, and a shared through/right-turn lane on the southbound approach.

Given the relatively low left-turn volume exiting Kingston Road (10 vehicles during the AM peak hour and 15 vehicles during the PM peak hour) a traffic signal is not recommended. In fact most vehicles entering the corridor and turning left would do so at the Old County Road intersection. However, because trucks are prohibited from using Old County Road many of the left turning vehicles, particularly during the AM peak hour, are trucks. These trucks will experience long delays exiting left onto NH 125, and for this reason consideration should be given to the installation of a flashing beacon or perhaps an actuated traffic signal that operates only during particular hours of the day.

As an unsignalized intersection, the left-turn entering movements onto Kingston Road would operate at LOS A during the AM peak hour and LOS C during the PM peak hour. The right-

turn exiting movement from Kingston Road would operate at LOS A and LOS B during the morning and evening peak hours respectively. The low volume left-turn exiting movement from Kingston Road would operate at LOS E during the morning and LOS F during the evening peak hour.

Hunt Road and Newton Junction Road

Currently Hunt Road and Newton Junction Road intersect NH 125 to form two “T-type” unsignalized intersections. The two intersections, Hunt Road on the west side and Newton Junction Road on the east side, are separated by approximately 100 feet. The recommended long-range improvement plan is to align the two roadways so as to form a single intersection. This can be accomplished by either relocating Hunt Road so that it intersects NH 125 opposite Newton Junction Road, by relocating Newton Junction Road so that it intersects opposite Hunt Road, or by relocating both roadways so that a new intersection is formed somewhere between the two existing intersections. For graphical purposes the conceptual improvement plan depicts the third option of relocating both roadways to form a new intersection. However, it is important to recognize that additional study will be required to evaluate these alternatives, and therefore, this study is not recommending a particular alignment.

Regardless of its location, the new intersection will require the installation of a traffic signal and the widening of NH 125 to a five-lane cross section. Lane use along NH 125 at the intersection would consist of an exclusive left-turn lane, a single through lane, and a shared through/right-turn lane in each direction. Directional traffic at the intersection would be separated by a raised median. The intersection, with the proposed improvements in place, is projected to operate at LOS B under the year 2016 AM and PM peak hour conditions.

New Boston Road

Although currently an unsignalized intersection, the recommended interim improvements call for the installation of a traffic signal at the NH 125/New Boston Road intersection. Like the other primary intersections along the corridor, the long-range improvement plan for this intersection consists of the widening of NH 125 at the intersection to a five-lane section. Lane use along NH 125 at the intersection would consist of an exclusive left-turn lane, a single through lane, and a shared through/right-turn lane in each direction. Directional traffic at the intersection would be separated by a raised median. The recommended improvements would likely involve the elimination of the existing right-turn slip lanes. However, consideration should be given to the possible use of these slip lanes as an opportunity for vehicles to reverse direction as part of the access management plan. The intersection, with the proposed improvements in place, is projected to operate at LOS B under the year 2016 AM and PM peak hour conditions.

Depot Road

Unlike the other primary signalized intersections along the corridor, the project traffic volumes at the intersection will not necessitate a five-lane cross section along NH 125. However, to provide an acceptable level of service (LOS D or better) two through lanes will

be necessary on the NH 125 northbound approach to the intersection. Therefore the long-range improvement plan calls for four-lane cross section consisting of an exclusive left-turn lane, a single through lane, and a shared through/right-turn lane on the northbound approach, and an exclusive left-turn lane, and a shared through/right-turn lane on the southbound approach. Directional traffic at the intersection would be separated by a raised median. The intersection, with the proposed improvements in place, is projected to operate at LOS B under the year 2016 AM and PM peak hour conditions.

Exeter Road

The recently upgraded NH 125/Exeter Road intersection will, under the long-range improvement plan, need to be widened to a five-lane section along NH 125. Lane use along NH 125 at the intersection would consist of an exclusive left-turn lane, a single through lane, and a shared through/right-turn lane in each direction. Directional traffic at the intersection, as it is under existing conditions, would be separated by a raised median. The recommended plan also calls for the widening of the Exeter Road westbound approach to provide an exclusive right-turn lane to reduce the queuing on that approach and allow right-turn vehicles to be processed through a channelized right-turn lane under yield control. The intersection, with the proposed improvements in place is projected to operate at a LOS B and C under the year 2016 AM and PM peak hour conditions respectively.

Marshall Road

The recent upgrade to the NH 125/Marshall Road intersection, which consisted of the elimination of a jug-handle and the provision of an exclusive left-turn lane, will be sufficient from a lane use perspective through the year 2016. However, the long-range plan does call for the installation of a traffic signal. The intersection, with the proposed improvements in place, is projected to operate at LOS B under the year 2016 AM and PM peak hour conditions.

Land Use and Access Management

Overview

While communities are becoming increasingly concerned about the effects of development on community character, quality of life and the costs of providing services (transportation), conventional regulatory practices have only perpetuated these land development problems. The clearest evidence of this trend is the cycle of functional obsolescence created by strip commercial developments along major arterials such as NH 125. Clearly, the practice of strip zoning major corridors has been widespread. Ease of accessibility and expedience are the primary reasons for such zoning. The extension of utilities along highway rights of way further promotes this pattern of development, and commercial developers favor these locations because of the low development costs and ready supply of customers.

As this form of development intensifies, the growing number of curb cuts (driveways) and resultant turning movements conflict with the intended function of arterials - to move people and goods safely, quickly and efficiently. Unlike downtown centers, commercial strips are rarely designed for pedestrians or transit, and due to the linear development pattern, pedestrian amenities are largely unsuccessful (Kittery, Maine).

The result of strip development is reduced level of service of the arterial which is typically remedied by adding lanes, raised medians, and other expensive retrofitting measures to try to maintain the capacity of the corridor for regional traffic. Heavy traffic coupled with undesirable traffic control measures often cause businesses to relocate from the corridor, increasing vacancies and lowering property values. As illustrated, the initial costs borne by the developers of strip commercial corridors are low, yet the long-term public cost to remedy the effect on the corridor are substantial.

This cycle and pattern of development is widespread, but not inevitable; it directly relates to the lack of adequate regulatory and access controls and inherent problems in current planning and regulatory practice.

The following sections examine regulatory techniques that support multiple aspects of access management.

General Land Use Recommendations

Future land use along the NH 125 corridor within Plaistow and Kingston must be considered in context of the overall master planning in these communities. Both communities are, or will soon be, preparing major updates to their master plans. This represents an idea time, therefore, to consider land use policies for the corridor. In general, both communities consider some future develop along NH 125 to be important to their economic development and diversification of tax base. Although from a traffic management standpoint it would be most advantageous to severely limit the future development of large traffic generators, such a policy is unlikely to be adopted, especially in the southern most sections of the study area. Future land use policy, however can and should be designed to minimize traffic impacts on the corridor. In this context, the following general land use recommendations are proposed:

- Plaistow should increase building setback requirements for new development and redevelopment along the corridor to at least 110 ft. from the NH 125 centerline.
- Kingston should consider adopting multi-tiered zoning districts along NH 125 to affect greater control over the type and intensity of uses allowed. The town should also amend its impact fee ordinance to incorporate NH 125 specifically to help implement access management improvements.
- Both communities should, to the extent practical, encourage future development to be located in centers or nodes and in planned developments. Conversely, the towns should discourage linear strip development between major development nodes. To facilitate

nodal development the towns should encourage the development of service roads to access land behind the first tier of roadside development.

- Both Plaistow and Kingston should develop access management plans to consist of (1) conceptual access plan for NH 125, (2) relevant amendments to master plans, zoning ordinances and site and subdivision regulations, and (3) the establishment of a Memorandum of Understanding with the NHDOT to incorporate local site plan approvals for access prior to issuance of state driveway permits. Local access management regulations should, among other things, include standards to strictly limit the number and spacing of driveways per site, should strongly encourage shared driveways and cross-lot access between sites and should direct access to intersecting side streets wherever possible. Specific access management standards follow.

The Regulatory Aspects of Strip Development

No state agency has the authority to prevent strip development, or to prohibit access to land abutting state highways. The NHDOT has jurisdiction over access to state highways, but it is limited. NHRSA Chapter •236 regulates driveways and other accesses to state highways including the permitting process, sight distance, numbers of permitted driveways, drainage, and maximum geometric standards for commercial driveways. However, the NHDOT can not prevent strip development. Driveway permits issued by the NHDOT do not override local regulatory requirements.

Absent state regulation of strip development, only local government can control development along state highways. Local governments have the authority to prepare and adopt Master Plans and Zoning Ordinances to guide development patterns and limit or prohibit strip development. Additionally, through proper and appropriate Subdivision and Site Plan Review Regulations, local governments can enact access management controls to regulate the placement and design of driveways.

Access Management

For the purpose of this report, access management means local oversight of all means of vehicular access onto NH 125 in order to maintain the safety and efficiency of the highway. Practically, it means appropriately spacing or limiting the number of driveways onto NH 125 while also, and as a result, removing the slower turning vehicles from the highway as efficiently as possible. The access management tools contained in this report are both preventative; designed to be implemented prior to the development of NH 125, and restorative; designed to increase the efficiency of existing points of access. The tools contained herein may be inserted via amendment into Plaistow's and Kingston's existing regulatory scheme, including zoning, site plan review, and subdivision regulations.

STANDARDS

Zoning

SETBACKS. Adequate setbacks should be required to allow for flexibility in locating driveways, future frontage road construction, adequate driveway throat-length, and to accommodate future right-of-way and/or roadway widening including the addition/extension of sidewalks or bicycle paths/shoulders. The NH 125 ROW varies in width; it is therefore suggested that setbacks be measured from the centerline of the highway. It is recommended that building setbacks be no less than 110'. Additionally, undeveloped front yards should be required to be no less than 40' in width (larger where ROW is narrower).

FRONTAGE. Increasing minimum frontage requirements effectively reduces the potential number of access points onto NH 125. It is recommended that lots within zoning districts where the minimum lot size is less than or equal to 1 acre that the minimum frontage required be 250'. Lots in districts requiring larger minimum lot sizes should be required to have 400'.

DRIVEWAY TURN-AROUND AREAS. This regulatory requirement may be added to a Zoning Ordinance, although it may also be adopted as a Selectmen's Ordinance, as it will be largely applied to private residential driveways. A driveway turn-around merely eliminates the necessity to back onto NH 125, creating the potential for collision.

SIGNS. While sign regulation is not typically a component of an access management regulatory scheme, two very specific tools are offered for consideration. Off-premise signs, not limited to billboards, create visual confusion, which in turn can have the potential of creating traffic hazards. It is recommended that along the NH 125 corridor, off-premise signs not be permitted. Freestanding sign location(s) should be sufficiently regulated so that they provide adequate information without causing confusion for the traveling public. Specific setback requirements must be based upon several factors, including the posted speed of the road, building setback requirements, dimensional standards for size including area and height, and lighting method.

ACCESS MANAGEMENT OVERLAY DISTRICT. The use of overlay districts as a method for managing access along commercial corridors is rapidly increasing across the United States and will likely become a useful planning tool in New Hampshire. The tool is used to overlay a special set of requirements onto an existing District, while retaining the underlying zoning and its associated requirements. Language that specifies standards for the Access Management Overlay District is integrated into the Zoning Ordinance while corridors (overlays) are designated on the zoning map. Overlay District requirements may address a myriad of access management issues including joint access, interconnecting driveways, driveway spacing, as well as limitation on new driveways.

MIXED-USE ZONING. For the purposes of this report, mixed-use zoning means allowing a broad and diverse range of land uses both within established districts, and throughout town. The purpose of creating a broad mixture of uses is to reduce the number of vehicle trips

necessary for work, shopping, recreation and other purposes, all of which contribute to reduced levels of service. Many communities are identified as, and have made concerted efforts to become residential bedroom communities. The residents of these communities, because employment and other opportunities are scarce or non-existent, must travel out of town to meet their needs. Similarly, allowing mixtures of land uses within zoning districts can have the same effect of reducing the number of trips generated, at least within the district.

Site Plan Review

MINIMUM DISTANCE BETWEEN DRIVEWAYS. The minimum distance between driveways on the same and opposing side of NH 125 (unless otherwise specified in section 1 next below), including all road intersections shall be measured from the centerline of the driveways at the right-of-way line and shall be a function of the posted speed in accordance with the following table:

MINIMUM DISTANCE BETWEEN DRIVEWAYS

Highway Speed	Minimum Spacing
35	150'
40	185'
45	230'
50	275'

SOURCE: "Access Management for Streets and Highways," Federal Highway Administration, 1982

The centerlines of all new driveways should be aligned with driveways, and road intersections on the opposing side of NH 125, if they exist. If such an alignment is not feasible, the driveways shall be offset in accordance with Section A, above.

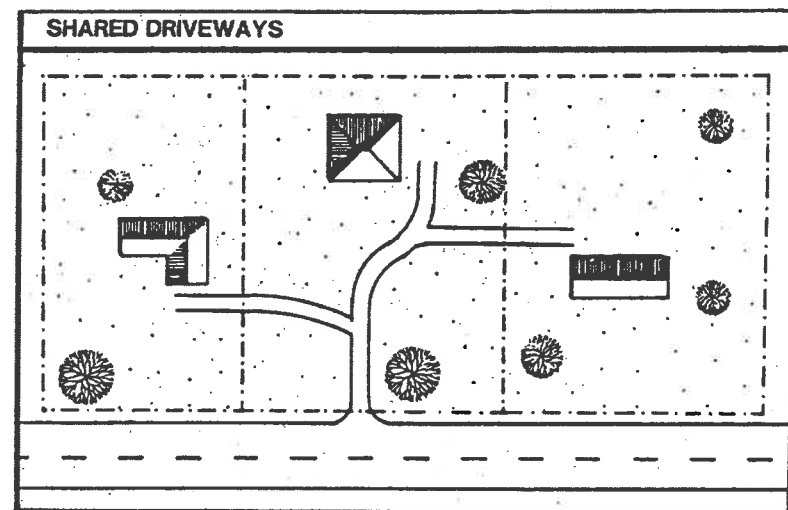
DRIVEWAY WIDTH. Commercial driveways shall not exceed 36 feet in width, measured perpendicular to the driveway at its narrowest point. The driveway shall be flared at the property line with minimum radii of 25'. All driveway entrances (regardless of the presence of curbing on NH 125) shall be curbed from NH 125 to at least the end of the radii at the driveway throat.

MAXIMUM NUMBER OF DRIVEWAYS PER LOT. Lots which have frontage only on NH 125 shall be allowed a single driveway, except that two, one-way driveways may be substituted for a singular driveway, provided that the minimum required distance between driveways can be met.

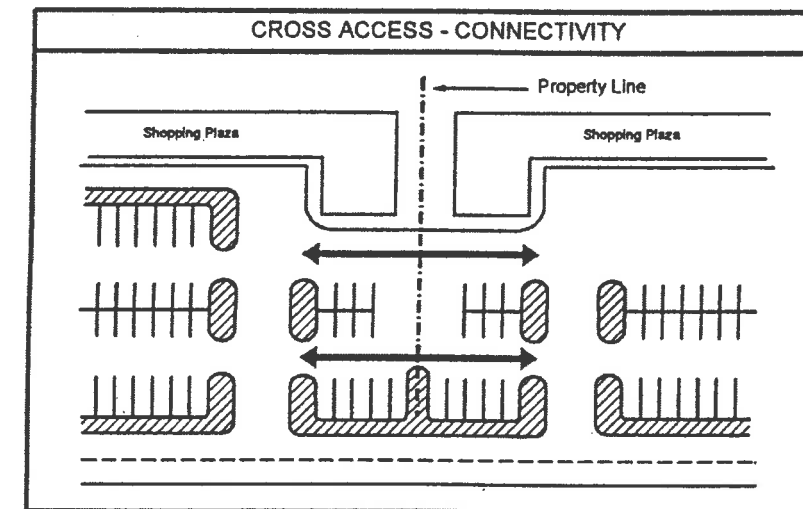
SHARED DRIVEWAYS. In order to minimize the number of driveways along NH 125, shared driveways shall be encouraged for adjacent sites. The following (*OPTIONAL*) dimensional requirements may be reduced if shared driveways are provided as follows:

- The minimum lot size and the minimum road frontage shall be reduced by a total of 10% if the entire site is accessed by a single shared driveway with an adjacent site.
- The minimum lot size and the minimum road frontage shall be reduced by a total of 20% if the entire site is accessed by a single shared driveway with an adjacent site on a highway other than NH 125, and which is appropriately zoned for the use.

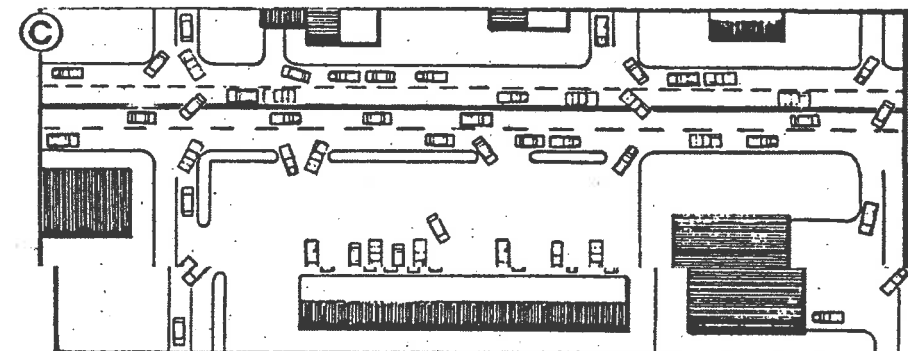
* This Site Plan Review Regulation would necessitate an amendment to the relevant section of the Zoning Ordinance.



INTERCONNECTING DRIVEWAYS. All projects subject to Site Plan Review shall provide interconnecting driveways or easements for future construction of driveways that will provide and promote vehicular and pedestrian access between adjacent lots, without accessing NH 125 to all property lines, and shall be designed to provide safe and controlled access to adjacent developments where they exist. Every effort should be made by the Planning Board to require construction of these driveways in anticipation of future developments.

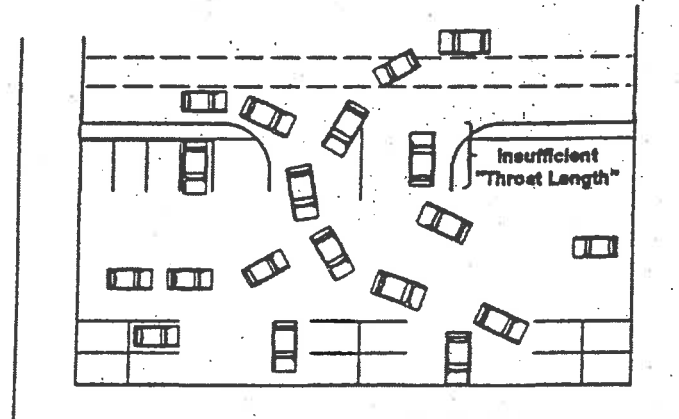


ACCESS TO LOTS WITH MULTIPLE FRONTAGES. Lots with frontage on both NH 125 and an adjacent or intersecting road shall not be permitted to access NH 125, except where it can be demonstrated that other potential access points would cause greater environmental or traffic impacts.



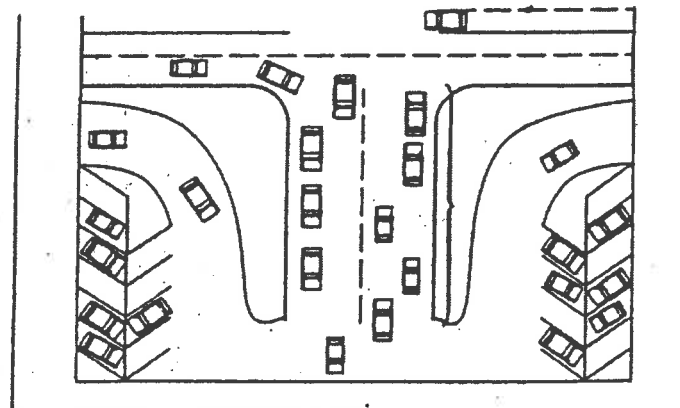
DRIVEWAY (THROAT) LENGTH. The minimum length of a driveway shall be of adequate length to accommodate the queuing of the maximum number of vehicles, as defined by the peak period of operation identified in a traffic study. The driveway shall be designed to accommodate the free flow of traffic onto the site so as to minimize the chance of vehicles backing onto NH 125.

Example of Insufficient Throat Length



Insufficient throat length and poor site planning can cause unsafe conditions and result in vehicles backing out onto the arterial, thus interrupting traffic flow.

Example of Sufficient Throat Length



With adequate throat length, stacking, or queuing, occurs on site. This reduces driver confusion, traffic problems, and unsafe conditions.

CORNER CLEARANCE. Lots with frontage on NH 125 and an adjacent or intersecting road, which, due to environmental or traffic impacts, can not access the adjacent or intersecting streets shall comply with the following standards:

ADEQUATE ON-SITE CIRCULATION AND STORAGE. Adequate number of parking spaces, aisle widths, raised medians, and tractor-trailer access, promotes safe and efficient movement into and out-of the site.

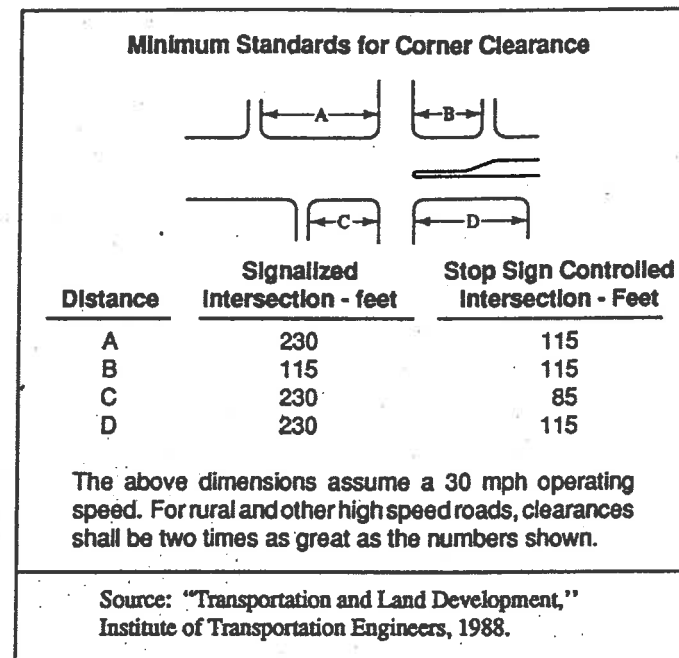
LANDSCAPING, BUFFERING. Landscaping and buffering are especially important along road frontages, and within parking lots. Adequate buffers and properly designed landscaping assists in the identification of driveway entrances and necessary signage, in addition to controlling light diffusion onto abutting properties. Landscaping located within raised medians separating aisles of parking spaces controls internal lot circulation and establishes safe and efficient traffic patterns.

Subdivision

INTERCONNECTING DRIVEWAYS. All projects subject to Subdivision Review shall provide interconnecting driveways or easements for future construction of driveways that will provide and promote vehicular and pedestrian access between adjacent lots, without accessing NH 125 to all property lines, and shall be designed to provide safe and controlled access to adjacent developments where they exist. Every effort should be made by the Planning Board to require construction of these driveways in anticipation of future developments.

ACCESS TO LOTS WITH MULTIPLE FRONTAGES. Lots with frontage on both NH 125 and an adjacent or intersecting road shall not be permitted to access NH 125, except where it can be demonstrated that other potential access points would cause greater environmental or traffic impacts.

CORNER CLEARANCES. Lots with frontage on NH 125 and an adjacent or intersecting road, which, due to environmental or traffic impacts, can not access the adjacent or intersecting streets shall comply with the following standards:



MINIMUM DISTANCE BETWEEN DRIVEWAYS. The minimum distance between driveways on the same and opposing side of NH 125 (unless otherwise specified in Section 1 next below), including all road intersections shall be measured from the centerline of the driveways at the right-of-way line and shall be a function of the posted speed in accordance with the following table:

Minimum Distance Between Driveways

Highway Speed	Minimum Spacing
35	150 feet
40	185 feet
45	230 feet
50	275 feet

Source: Access Management for Streets and Highways", Federal Highway Administration, 1982.

SHARED DRIVEWAYS. In order to minimize the number of driveways along NH 125, shared driveways shall be encouraged for adjacent residential sites.

ADDITIONAL COMPONENTS OF ACCESS MANAGEMENT

Access Management Plan

An Access Management Plan is a graphic representation of the arterial being managed, NH 125 developed in cooperation/consultation with abutting and affected landowners. The Plan is an advisory tool of sufficient detail (parcel specific) which delineates present and future driveway locations; joint accesses; intersections, including present and future plans signalization; and frontage/service roads. The purpose of the Plan is to provide for the orderly development/redevelopment of the corridor in compliance with the access management standards adopted by the town. Prospective developers of properties along the corridor should be required to incorporate and construct the appropriate components of the Plan into their development plans.

Master Plan

INTRODUCTION. Access management is only one of a myriad of aspects of planning for the future of a community. It is a tool that can be used to better facilitate the movement of people, goods and services within and through communities. Ideally, access management should be developed as a product of the Master Plan. Proper access management standards are best implemented after a community has determined:

- **Land Patterns.** Where development should be encouraged and where it should be limited. Of paramount importance, future land use decisions will likely have more of an impact on traffic conditions than access management alone in reducing future traffic problems on arterial highways;
- **Traffic Flow.** The extent to which arterial traffic volumes have increased in recent years and are likely to increase in the future; and
- **Plan's Relationship to Access Management.** How the community's transportation and land use policies can be enhanced by sensible access management standards.

PURPOSE OF THE MASTER PLAN. A local Master Plan is an important policy document that establishes the desired future pattern of development. There are a number of ways in which the Master Plan can address access management issues and establish a basis for an effective access management program.

GOALS AND POLICIES. The goals and policies established in the Master Plan can directly address strip development by making recommendations such as:

- Designate compact growth areas and limit the amount of development that can occur along less developed/rural arterials;

- Prohibit strip development along NH 125 (and other arterials where appropriate), including a proliferation of single lot development;
- Include standards in the Site Plan Review and Subdivision Regulations to ensure that development along NH 125 does not significantly reduce traffic safety and carrying capacity;
- Require traffic impact analyses for all Site Plan Review and Subdivision applications exceeding a certain threshold;
- Address alternative modes of transportation such as bicycles, buses and trains. Transportation Demand Management (TDM) options such as vanpools, carpools, as well as the provision of bicycle lanes, pedestrian amenities and bus stops may also be included.

FUTURE LAND USE PLAN/MAP. The town's future land use plan/map should include recommended zoning districts that direct growth away from NH 125, where possible. Land abutting NH 125 may be downzoned while more appropriate growth areas are rezoned to allow for a denser pattern of development.

Frontage/Service Road Provisions

The planning and development for future frontage/service roads involves the adoption and coordination of several of the tools presented in this report. The intended difference in the meaning of frontage and service roads merely relates to the physical location of the road. Frontage roads are roads which run parallel to the arterial, providing access to those businesses which now front on this road, instead of directly accessing the arterial. Relocate the frontage road away from the arterial and they become service roads. The proper development of frontage/service roads will require coordination of (at a minimum) the following regulations:

- Establish the need for Access Management Master Plan (Transportation & Land Use Chapters).
- Prohibit direct arterial access. Access Management Plan.
- Require ample front setbacks, free of structures and parking lots. Zoning Ordinance.*
- Identify NH 125 as an Overlay District. Zoning Ordinance.
- Provide allowances for constructing front service roads in the applicable buffer areas. Site Plan Review Regulations.

*Frontage roads may be constructed within either the State ROW, a newly created town ROW or within the front buffer of the subject parcel.

SITE SPECIFIC ACCESS MANAGEMENT RECOMMENDATIONS

As part of the corridor study, a field reconnaissance was conducted in the Spring of 1998 to evaluate specific access management improvements, especially with respect to the consolidation and alignment of driveway entrances. The potential for the establishment of service roads that could provide alternative access to businesses and residences on NH 125

was also evaluated. The scope of this study did not permit a detailed, site-level feasibility analysis of the recommendations, however, they can serve as useful guidance both to property owners and the Planning Boards in Kingston and Plaistow as they evaluate site development plans and consider traffic mitigation requirements in the future.

The following summarizes the specific recommendations. The recommendations are keyed to the Long Range Improvement plans, beginning with Figure 26, and are shown as heavy black lines on the aerial photography. For reference purposes, the specific access management recommendations are designated numerically as ACCESS-1, ACCESS-2, etc. It should be noted that the lines shown of the plan sheets are not intended to depict the exact placement of future access improvements, nor is it assumed that all the access improvements shown will be implemented within the timeframe of the corridor reconstruction. Many, especially those involving secondary service roads, will require private and/or municipal funding.

Specific Recommendations

ACCESS-1 (FIGURES 26 & 27). Beginning at the signalized intersection at East Road and proceeding north, a section of commercial development on the west side has extended areas of open driveways with poorly defined entrance points. Efforts should be made during the roadway reconstruction to curb and consolidate these driveways. Likewise, on the east side there are multiple businesses with poorly defined access points. At the entrance point to Brickyard Square, an opportunity appears to exist to construct a secondary access road behind the existing frontage businesses that would allow vehicular access between the businesses without re-entering NH 125. *Wetlands?*

ACCESS-2 (FIGURE 26 & 27). In addition, the town should require a secondary access road or roads when the vacant parcel across NH 125 is developed. The secondary access roads from both sides should intersect NH 125 at the same point.

ACCESS-3 (SEE FIGURE 27). The proposed project intersection improvements at NH 125 and Danville Road will create a new signalized "T-type" intersection. On the east side of NH 125 at this location are two parcels that are likely to be redeveloped for highway commercial uses. The opportunity exist to manage access at this location by creating a short internal service roadway or driveway along the property line that would serve both parcels and intersect NH 125 as a fourth leg of the Danville Road intersection.

ACCESS-4 (FIGURE 27). Potential connector roads are shown that could be created to provide alternate access to a large mostly undeveloped area between Jesse George Road and Main Street (NH 121A). Given the proximity to two major intersections (at Main Street and a future signal at Danville Road), future access to any major traffic generator on this land should be directed to points off NH 125. It may also be desirable to the interior access shown in AM-3 to AM-4 to gain indirect access to the signalized intersection.

ACCESS-5 (FIGURE 28). The realignment and "teeing" of the Kingston Road/NH 125 intersection presents the opportunity to align a driveway entrance or entrance to an internal

access road that could access existing development both to the immediate north and south of the location (condominium warehouses and an RV dealership).

ACCESS-6 (FIGURE 28 & 30). The area to the west on NH 125 in the vicinity of Dorre Road is zoned industrial and has the potential to generate a significant volume of traffic in the future. The access management recommendation is to develop an interior access road parallel to NH 125 that would connect the access road to the Galloway Industrial Site north to Dorre Road to the Torromeo Industrial Site.

ACCESS-7 (FIGURE 30). Kingston Advisory Committee members have suggested a long-term improvement to the intersection of Old Coach Road and NH 125 that would involve relocating the intersection approximately 300 feet to the north (part on existing A-frame commercial building) and realigning it to a more perpendicular approach to NH 125. This action would improve intersection sight distance and alignment and move the intersection away from traffic turning and entering the Pond View Restaurant.

ACCESS-8 (FIGURE 31). A connector road is recommended to be constructed parallel to NH 125 from Meeks Road northward to the new NH 111 Bypass intersection with NH 125. This road will provide a secondary access road for existing and future land use on the east side of NH 125, including the Kingston Recreation Area at the Kingston Fairgrounds. It is also recommended that particular attention be given to good bicycle and pedestrian access along this access road due to expected heavy use by children. It is recommended that the existing northern end of Meeks Road as it intersects NH 125 be closed and traffic redirected to the access road.

ACCESS-9 (FIGURE 33 & 34). A connector/access road is proposed parallel to NH 125 running from Depot Road (NH 107), beginning about 700 feet east of NH 125/NH 107 intersection, running northward approximately 2,500 feet, and re-entering NH 125 at a new "T-type" intersection (See Figure 33). The path of the road is that of an old roadbed that parallels NH 125 back approximately 130 feet from the edge of pavement. The purpose of this road would be to provide access to land along a controlled access portion of NH 125. Although this road would serve no transportation need if it existed today, any future proposal to develop this land should include provision for the construction of this type of access roadway.

ACCESS-10 (FIGURE 34). A future internal access road is proposed to provide single-drive access to vacant land at the southwest corner of the NH 125/NH 111 (Exeter Road) intersection. The purpose is simply to eliminate the potential for multiple driveways being constructed in close proximity to this busy intersection. The actual need and timing of this roadway should be evaluated at the time that this land is proposed for development.

ACCESS-11 (FIGURE 35). Substantial developable land exists with commercial use potential in the rural residential area west of NH 125 and just south of the Sears Logistics Center building. It is recommended that any future development at this location be required to access the site through the existing driveway to the industrial park, with a connection to an internal roadway system to the developable land.

Implementation

The access management facilities that are recommended above are conceptual in nature. The need, cost and site location for the internal access roads proposed would need to be evaluated and reaffirmed by the respective towns as development activity occurs on the parcels they serve.

It is presumed that in most cases, the roads will be constructed with private funds and in a "piecemeal" fashion as part of the on-site and off-site improvements that each community may require in the approval process. There may be some roadways that serve the public need, and to that extent warrant the expenditure of public funds for implementation.

Each of the access management recommendations will require further evaluation with regards to feasibility, cost and utility, and, as appropriate, developed conceptually in more detail. Those that are found to have merit should, together with the general design and regulatory standards included in the previous section, form the basis of the local access management plans in Kingston and Plaistow and adopted as part of the community Master Plan.

Preliminary Construction Cost Estimate

An order of magnitude preliminary construction cost estimate was prepared for the recommended long-range improvement plan. The order of magnitude estimate is based on current (1998) construction costs and does not include the cost of land taking. The total construction cost of the proposed long-range plan is approximately \$21,480,000. The preliminary construction cost estimates broken out by intersection and roadway segment are as follows:

INTERSECTIONS:

Marshall Road	\$ 75,000
Exeter Road	\$ 1,510,000
Depot Road	\$ 1,395,000
New Boston Road	\$ 1,485,000
Hunt Road/Newton Junction Road	\$ 1,750,000
Kingston Road	\$ 1,180,000
Old County Road	\$ 1,485,000
Danville Road & Main Street	\$ 2,470,000
	\$11,350,000

SEGMENTS:

NH 125 from Exeter Road to Newton Junction Road	\$ 3,990,000
NH 125 from Newton Junction Road to Kingston Road	\$ 2,915,000
NH 125 from Old County Road to Main Street	\$ 967,500
NH 125 from Jesse George Road to East Road	\$ 2,257,500
	\$ 10,130,000

Project Prioritization

The recommended long-range corridor improvement plan, as described in the previous section and as depicted in Figures 26 through 35, are based on a 20-year design horizon. Given the substantial cost of the overall plan and given that particular components of the plan will be needed sooner than others, it is important that the communities in conjunction with the NHDOT establish an implementation program for specific components of the plan.

Through input from the NH 125 Technical Advisory Committee, each of the improvement projects have been programmed into three groups for the purpose of establishing priorities.

Group 1 has been assigned the highest priority, with Group 2 second, and Group 3 last. The projects within a specific group are not prioritized in any particular order. The projects have been prioritized as follows:

Group 1	Hunt Road/Newton Junction Road Intersection Danville Road and Main Street Intersections NH 125 from Jesse George Road to East Road <i>Group 1 Costs - \$ 6,477,500</i>
Group 2	Kingston Road Intersection Old County Road Intersection NH 125 from Old County Road to Main Street <i>Group 2 Costs - \$3,632,500</i>
Group 3	Marshall Road Intersection Exeter Road Intersection Depot Road Intersection New Boston Road Intersection NH 125 from Newton Junction Road to Kingston Road NH 125 from Exeter Road to Newton Junction Road <i>Group 3 Costs - \$11,370,000</i>

MPO Transportation Plan / TIP Process

The biennial update of the Salem-Plaistow-Windham (SPW) Metropolitan Planning Organization (MPO) Transportation Plan and Transportation Improvement Program has taken place concurrently with the completion of this study. The project-specific recommendations and the grouped priorities identified in the study have served to guide the project application process. The long-range projects identified under Groups 1 and 2 have been submitted to the New Hampshire Department of Transportation (NHDOT) for consideration under the current update of the State of New Hampshire Ten-Year Transportation Improvement Program.

While the outcome is uncertain, the intent of the submittal is for these project-specific recommendations to be funded out of the existing \$10.333 million NH 125 reconstruction project that is listed in the currently adopted State Ten-Year Program (Project # 10044B). The current funding level is approximately sufficient to construct the improvements identified under the first two groups. The third group is included in the long-range element of the MPO Transportation Plan and is recommended for inclusion in the State Ten-Year Program as soon as financially feasible. This study will be forwarded to the NHDOT to be used as a guide in the implementation process.